ANGLER USE AND HARVEST SURVEYS ON SPRING CREEK BELOW SHERIDAN LAKE, SOUTH DAKOTA, 1997 - 1998

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Angler Use and Harvest Surveys on Spring Creek Below Sheridan Lake, South Dakota, 1997-1998

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PREFACE

The data presented in this report were collected in 1997 and 1998. Copies of this report and references ts the data can be made with permission from the authors sr from the Division of Wildlife Director, South Dakota Department of Game, Fish and Parks, 523 E. Capitol, Pierre, South Dakota, 57501-3182.

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EXECUTIVE SUMMARY

A creel survey was conducted from July-August, 1997 and 1998 at Spring Creek, Pennington County, South Dakota. Seven goals were outlined in regards to the Spring Creek fishery.

1. To determine if the angler catch of 0.5 trout/hour goal for stocked waters was met. Results showed that a combination catch of brown and rainbow trout achieved this goal.

2. To determine if the current stream classification was consistent with those stated previously. Stream survey data indicated that this section was still within the BRA classification (less than 25 brown trout per acre of water).

A. To quantify the extent of angler satisfaction. Overall, 71 % of Spring Creek anglers expressed satisfaction with their day's fishing experience.

4. To determine angler demographics by angling method. The majority of anglers were fly fishermen. Bait fishermen were second in overall percentage and spin fishermen third.

5. To determine the effectiveness of the large fish management in Spring Creek. An increase in the number of anglers and the total time spent fishing more than doubled from "pre largefish" management. Non-resident anglers fished Spring Creek at higher rates than other popular Black Hills waters. The high non-resident component may also indicate success from a large fish management perspective.

6. To determine the fishing pressure on an easily accessible stream. The time anglers spent fishing (angler hours) was similar for both units of the survey. Trip lengths were different between the two units and may suggest that anglers with easy access spend less time fishing or are more mobile.

7. To design a 5-year management plan. The plan recommends continued stocking of large rainbow trout. Placement of large rainbow trout during low water conditions would be in local lakes. A five-year schedule for stream survey work was also established.

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INTRODUCTION

According to the 1994 Statewide Angler Use and Preference Study, trout were the third most sought after species of fish in the western half of South Dakota (Mendelsohn, 1994; Stone, 1996). Most of these trout anglers lived in or near the Black Hills. One specific area of interest to these anglers was Spring Creek, located southwest of Rapid City in Pennington County. Spring Creek is preferred by local fishermen because of the easy access and excellent fishing opportunities.

Management regulations for these stream sections were changed in 1997 including one trout 14" or longer that may be included in the daily creel limit of five trout. Some of these sections of stream were associated with questions in the 1994 Black Hills Use and Preference Survey. One of the preliminary results of this survey indicated that anglers wanted fewer, larger fish rather than high catches of smaller fish. Due to this observation, management of these sections of stream was changed to a large fish option where fewer, larger fish were stocked throughout the summer months. A creel survey was conducted (June through August) in 1997 and 1998 to determine the effectiveness and angler satisfaction to this type of management in a stream.

Directly above these sections of stream is Sheridan Lake. Sheridan Lake was formally managed as a trout fishing lake. However, cool and warmwater species in the lake increased competition with fingerling trout which required a change in management. Spring Creek's water source is almost exclusively from Sheridan Lake. Historically, some of Spring Creek's electrofishing sites have been denatured during dry periods because of low flows out of Sheridan Lake and an annual fall drawdown of the lake for vegetation control. High stream flows along with the removal of the drawdown practice has contributed to more fishing chances and a constant water supply in Spring Creek.

The current management allows for the stocking of large catchable brown trout in Section A (Sheridan Lake Road upstream to Sheridan Lake). The stated objective of the Black Hills Stream Management Plan calls for 75% return of stocked catchable fish with an overall catch rate of 0.5 fish per hour.

GOALS

The goals of this survey were to:

- Achieve a catch rate of 0.5 fish per hour.
- Determine if the stream classification (as stated in the 199A Black Hills Stream Management Plan) of BRA for reach #A of Spring Creek is still accurate.
- Quantify angler satisfaction.
- Quantify angler demographics by angling method.
- Determine the effectiveness of large fish management.
- Determine the fishing pressure on an easily accessible stream.
- Determine the release rates of all trout in the fish management sections.
- Develop a 5-year management plan for Spring Creek.

STUDY AREA

The Spring Creek watershed is owned by 85.8% U.S. Forest Service (81,818 acres or 31,111 ha) and 14.2% private (13,493 acres or 5,461 ha). The bulk of U.S. Forest Service land is managed for timber production and is grazed through a permit process. Most of this land is covered by pine or spruce forest interspersed with meadows. Logging, thinning, and other typical timber management practices are continually ongoing. All activities contribute to the sediment distributed via Spring and Horse Creeks. Private land is less likely to be forested and more likely to be used for horse pasture, cattle grazing, home sites, or campgrounds. The watershed also contains the town of Hill City as well as several other small developments.

Water bodies within the Spring Creek watershed include Sheridan, Mitchell, Major, Newton Fork, Thompson, Marshall Gulch, and many unnamed farm ponds. Nearly the entire watershed consists of mountains with moderate to steep inclines. Roads and trails are prevalent throughout the watershed.

Sheridan Lake was constructed by the Civilian Conservation Corps as a recreational lake in 1939. Sheridan Lake and dam are maintained and operated by the U.S. Forest Service. The operation and maintenance of the campgrounds, picnic areas, parking lots, and boat launch facilities are under a special use permit to non-government entities. They also cooperate with the U.S. Forest Service with major maintenance and improvements during the off-season. Marina and concession operations are leased to private enterprise under other long-term use permits (Personal communication with Amy Ballad, USFS, 1995).

Emergent vegetation in the form of cattails is abundant in the shallow ends of bays, along shallow shorelines, and at the inlets of Spring Creek and Horse Creek. Submerging vegetation is abundant from the edge of the cattails to a depth of about 6-8 feet. This presents a problem with bank fishing along much of the shoreline. Algae blooms are common during the summer months and filaments algae is found along the shoreline.

Fisheries management on Sheridan Lake has recently changed. Sheridan Lake was receiving between 100,000 and 160,000 fingerling rainbow trout every year until 1997. In previous lake electrofishing surveys, northern pike were found in large numbers. These piscivorous fish, along with bass, perch, and crappie were assumed to have eaten large numbers of the trout fingerlings and were a reason for discontinuing this effort. The presence of yellow perch, largemouth bass, rock bass, green sunfish, and golden shiners in Spring Creek electrofishing surveys have likely emigrated from Sheridan Lake.

Water flow in Spring Creek below Sheridan Lake comes from three possible sources including spillway overflow, discharge tube releases, and natural spring runoff. Water from the overflow is directly proportional to the water coming into the lake minus evaporative loss. In years of high runoff, a larger amount of water is contributed from this source. Water temperatures can become somewhat elevated via this type of contribution as it is from the warm surface water. The discharge tube releases water from within the part of the water column that is colder than

that of the surface. In the past, this water was released during the fall for reduction of aquatic vegetation in Sheridan Lake. However, the water releases are again dependent on the amount of inflow as Sheridan Lake has high recreational use. The contribution of water from natural sources is probably somewhat limited in at least the upper reaches.

Trout management in the Black Hills is currently governed by the A993 Black Hills Stream Management Plan. According to this document, the following objectives are relevant to this report:

- To manage streams supporting a wild brown trout population to provide a fishery with an average angler catch rate of 0.50 trout per hour, including at least one brown trout AA inches or larger per day.
- To obtain a harvest of 75 percent of hatchery raised catchable trout.
- To provide a minimum overall average angler success rate of 0.50 trout per hour for Black Hills streams.

The stream classification system used for Black Hills trout streams is shown below (Erickson et al., A993). This classification is the basis for decisions regarding reach by reach management options. It is based on fall sampling of trout populations. The classification is based on fish sizes deemed to be acceptable to anglers and does not represent biological productivity of a stream.

Brown Trout Fisheries - based on number of fish in excess of 8 inches
Class BRA - number of wild brown trout exceeds A50 per acre
Class BRA - number of wild brown trout ranges from A5 to A50 per acre
Class BRA - number of wild brown trout is less than A5 per acre
Brook Trout Fisheries - based on number of fish in excess of 8 inches
Class BK1 - number of wild brook trout exceeds A50 per acre
Class BK2 - number of wild brook trout ranges from A5 to A50 per acre
Class BK3 - number of wild brook trout is less than A5 per acre
Rainbow Trout Fisheries - based on number of fish in excess of 8 inches
Class RB1 - number of wild rainbow trout exceeds 25 per acre
Class RBA - number of wild rainbow trout is less than or equal to A5 per acre

The current classification of Spring Creek (section A) is BRA. This classification implies that the stream is in need of support from hatchery stockings. In an attempt to fulfill the before mentioned results of the preference survey, large rainbow trout were stocked into Spring Creek along with regular stockings of catchable brown trout.

SAMPLING METHODS

Fish Population Surveys

Five reaches of stream were surveyed in A998 to assess the size of the wild fish populations as well as to quantify the movement of hatchery planted trout in Spring Creek from Sheridan Lake Road upstream to Sheridan Lake. Three pass electrofishing depletion surveys were employed in

order to determine the trout population within the stream reach. Historically, two backpack electrofishing units were used in the sampling process. However, during the 1998 sampling three units were used because of increased water flows. A distance of 100 meters was measured off and set as the limit for the lower and upper nets. All fish were kept separate from each succeeding pass. All fish were weighed (g) and measured (mm). In instances where a number of small fish were captured, a bulk weight was taken and later evenly divided among all individuals. Average stream width was determined from five, evenly spaced measurements along the stream. The results of the stream survey are presented in their entirety in Appendix B.

Data Analysis

Analysis of data for the fish population survey was performed with the use of the regional SIR database. Trout were separated into species categories, whether it was hatchery produced or wild, and its catchable or sub-catchable size status. Population estimates and confidence intervals were also determined.

Angler Use and Preference

This creel survey was patterned after a study design by Nelsons and Johnson (1983). The following procedures were specific to the operations of this study. Sampling was conducted during the summer months of June-August in 1997 and 1998 when fishing pressure was assumed to be at its peak. In order to determine the effects of big fish management on an easily accessible stream the entire reach was separated into two units. A stratified random sampling design was used since it was not economically feasible to sample the water during the entire three-month periods. Budgetary constraints limited manpower to 20 hours of clerk time per week. Work schedules were assigned as follows.

- 1 weekday shift and 1 weekend/holiday shift per week
- 50 percent of shifts were AM shifts and 50 percent PM shifts for both Weekdays and Weekend/ Holidays by month
- A random number generator was used to assign work dates and an AM or PM shift
- In 1997, AM shifts were from 7 AM to 1 PM. Evening shifts were from 2 PM to 8 PM. During the summer of 1997 it was noted that very few anglers were counted before 8 AM but that a significant number of anglers were still fishing after clerks completed their evening pressure counts. Consequently in 1998, morning pressure counts were conducted between 8 AM and 2 PM and evening pressure counts were conducted between 3 PM and 9 PM. At the beginning of each hour, clerks counted the fly fishermen and anglers using spinsters or baitcasters. A copy of the pressure count form is presented in Appendix Figure A.
- Individual angler interviews were conducted between pressure counts. Anglers were asked to estimate the amount of time they had fished and the number of fish they had released by species. For harvested fish, total length was recorded to the nearest millimeter. Each fish was identified by species as well as if it were hatchery produced or wild determined by fin erosion. Clip codes were recorded for all hatchery fish. Only anglers who had completed a fishing trip were interviewed and used for estimating fishing pressure and harvest.
- Each stocking was clipped with a unique code, see Appendix Table 1 for stocking dates and clip codes.

Angler Type

Creel clerks determined the type of angling pursued including either fly fishermen or spin fishermen. Fly fishermen were assumed to use only artificial flies. Spin fishermen were assumed to use either worms/grasshoppers, minnows, salmon eggs, corn, marshmallows, artificial lures, bread, or moldable baits.

License Type

Creel clerks determined what type of license was bought. Clerks asked the angler for their license in order to write down their name and address. The name and address information provided a basis for the inclusion of future mailings.

Angler Satisfaction

Angler satisfaction has become an important aspect in fisheries management towards the overall success of goals and regulations. Anglers were asked to rate their fishing experience. The exact question asked was, "Considering all factors, how satisfied are you with your fishing trip today?" Possible answers included, 1 = very satisfied, 2 = satisfied, 3 = neutral, 4 = dissatisfied, 5 = very dissatisfied.

Data Analysis

Data from the creel survey was compiled in spreadsheet format. Mean fishing time was computed for a total estimation of the number of hours fished. Values were calculated for the number of hours spent fishing, total fish/hour, and total number of fish caught.

RESULTS

Angler Demographics

Resident and Non-resident

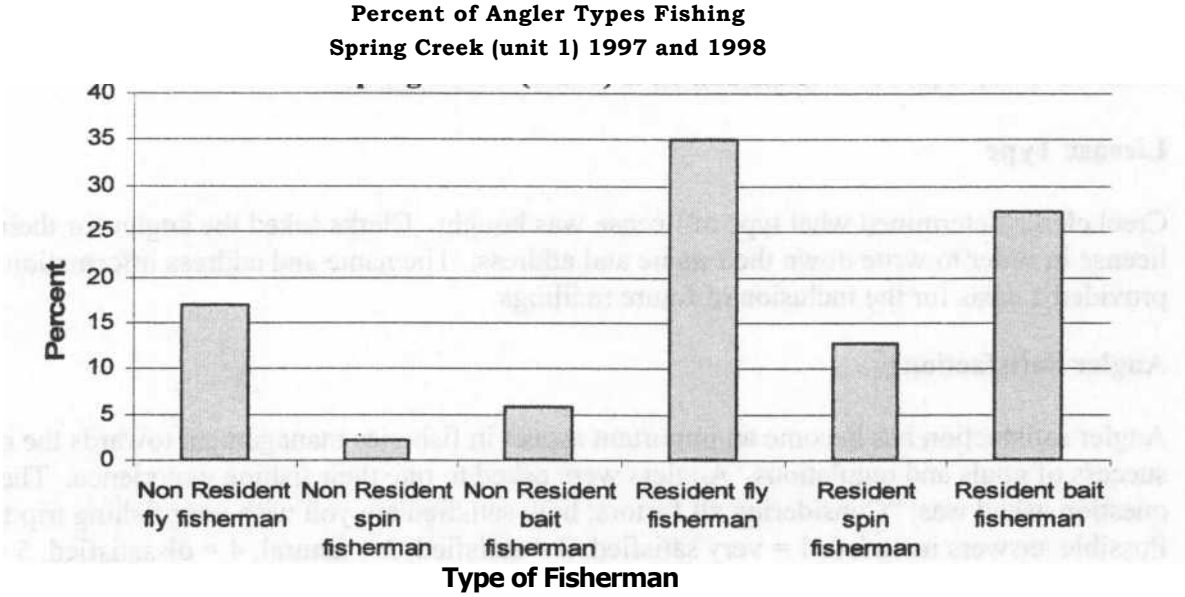

Figure 1. Anglers sorted by type that fished Spring Creek (unit 1) in 1997 and 1998.

Two hundred and ninety-six anglers were interviewed during the creel survey in Unit I (Tables 1 and A). Of these fishermen, 25% were non-residents and 75% residents. Fifty-two percent of the anglers were fishing explicitly with artificial flies (Figure 1). Thirty-two percent of the fishermen were using organic baits in some combination and the remaining seventeen percent were anglers using artificial spinners.

One objective of the Spring Creek creel survey was to determine the effectiveness of large fish management. During a creel survey on Rapid Creek in the Black Hills, non-resident anglers represented 19 percent of surveyed anglers (Whitcher and Erickson 1993). Rapid Creek is considered a prominent stream-fishing locale in the Black Hills. The fact that Spring Creek attracted a larger percentage of non-residents may be partially attributed to large fish management.

Table 1. Estimated angling pressure and catch rates sorted by shift and month for all trout at Spring Creek, Unit I (Sheridan Lake Road to walk-in area) from June 1 - August 31, 1997

Month	Weekday AM Count	Weekday AM Interval	Weekday AM ave trip	Weekday AM days/month	Weekday AM # censused	Weekday AM # anglers	Weekday AM # interviewed	Weekday AM into. hours	Weekday AM fish caught	Weekday AM total hours	Weekday AM fish/hr.	Weekday AM total catch
June	44	1	1.43	21	3	216	7	10.00	7	308	0.70	216
July	72	1	2.83	22	3	186	10	28.33	25	528	0.88	466
August	16	1	1.23	21	3	91	8	9.83	0	112	0.00	0

Month	Weekend AM Count	Weekend AM Interval	Weekend AM ave trip	Weekend AM days/month	Weekend AM # censused	Weekend AM # anglers	Weekend AM # interviewed	Weekend AM into. hours	Weekend AM fish caught	Weekend AM total hours	Weekend AM fish/hr,	Weekend AM total catch
June	96	1	2.20	9	3	131	15	33.06	17	288	0.51	148
July	119	1	2.72	9	3	131	20	54.33	72	357	1.33	473
August	65	I	1.90	t0	2	171	5	9.50	6	325	0.63	205

Month	Weekday PM Count	Weekday PM Interval	Weekday PM ave trip	Weekday PM days/month	Weekday PM # censused	Weekday PM # anglers	Weekday PM # interviewed	Weekday PM intv. hours	Weekday PM fish caught	Weekday PM total hours	Weekday PM fish/hr.	Weekday PM total catch
June	87	I	2.46	21	4	186	22	54.08	47	457	0.87	397
July	75	I	1.69	22	4	244	13	22.00	13	413	0.59	244
August	95	1	2.52	21	3	264	15	37.75	31	665	0.82	546

Month	Count	Weekend PM Interval	Weekend PM ave trip	Weekend PM days/month	Weekend PM # censused	Weekend PM # anglers	Weekend PM # interviewed	Weekend PM into. hours	Weekend PM fish caught	Weekend PM total hours	Weekend PM fish/hr.	Weekend PM total catch
June	102	1	1.27	9	2	361	12	15.26	23	459	1.51	692
July	110	1	2.69	9	2	184	23	61.96	41	495	0.66	328
August	145	I	2.42	10	3	200	22	53.25	64	483	1.20	581

ALL SHIFTS COMBINED FOR 1997 Unit I (Sheridan Lake Road to walk in area)

Month	Count	Interval	ave trip	# Days in month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish caught
June	329	1	2.01	30	12	893	56	112.4	94	1,512	0.84	1,452
July	376	1	2.52	31	12	745	66	166.62	151	1,793	0.91	1,510
August	321	1	2.21	31	11	726	50	110.33	101	1,585	0.92	1,332
Totals	1,026	I	2.26	92	35	2,364	172	389.35	346	4,890	0.89	4,295

Table 2. Estimated angling pressure and catch rates sorted by shift and month for all trout at Spring Creek, Unit 1 (Sheridan Lake Road to walk in area) from June 1 A - August 31, 1998.

Month	Weekday AM Count	Weekday AM Interval	Weekday AM ave trip	Weekday AM days/month	Weekday AM # censused	Weekday AM # anglers	Weekday AM # interviewed	Weekday AM intv. hours	Weekday AM fish caught	Weekday AM total hours	Weekday AM fish/hr.	Weekday AM total catch
June	113	I	1.86	22	4	334	12	22.33	42	622	1.88	1,169
July	56	1	1.75	23	4	184	8	14.00	0	322	0.00	0
August	51	1	2.00	21	3	179	7	14.00	12	357	0.86	306

Month	Weekend AM Count	Weekend AM Interval	Weekend AM ave trip	Weekend AM days/month	Weekend AM # censused	Weekend AM # anglers	Weekend AM # interviewed	Weekend AM intv. hours	Weekend AM fish caught	Weekend AM total hours	Weekend AM fish/hr.	Weekend AM total catch
June	105	1	2.00	8	2	210	3	6.00	5	420	0.83	350
July	107	1	2.25	8	2	190	8	18.00	24	428	1.33	571
August	75	1	1.67	10	3	150	9	15.00	12	250	0.80	200

Month	Weekday PM Count	Weekday PM Interval	Weekday PM ave trip	Weekday PM days/month	Weekday PM # censused	Weekday PM # anglers	Weekday PM # interviewed	Weekday PM intv. hours	Weekday PM fish caught	Weekday PM total hours	Weekday PM fish/hr.	Weekday PM total catch
June	106	I	4.16	22	4	140	20	83.15	95	583	1.14	666
July	65	1	2.32	23	3	215	13	30.16	8	498	0.27	132
August	58	I	1.50	21	3	271	12	18.00	7	406	0.39	158

Month	Weekend PM Count	Weekend PM Interval	Weekend PM ave trip	Weekend PM days/month	Weekend PM # censused	Weekend PM # anglers	Weekend PM # interviewed	Weekend PM into. hours	Weekend PM fish caught	Weekend PM total hours	Weekend PM fish/hr.	Weekend PM total catch
June	73	I	1.35	8	2	216	9	12.15	7	292	0.58	168
July	66	1	2.18	8	2	121	14	30.50	18	264	0.59	156
August	39	1	1.22	10	2	160	9	11.00	3	195	0.27	53

ALL SHIFTS COMBINED FOR 1998 Unit I (Spring Creek Roadto Walk in area)

Month	Count	Interval	ave trip	# Days in month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/ hour from interview	Calculated # fish caught
June	397	I	2.81	30	12	901	44	123.63	149	1,917	1.21	2,353
July	294	I	2.15	31	I1	710	43	92.66	50	1,512	0.54	859
August	223	1	1.57	31	II	759	37	58.00	34	1,208	0.59	717
Totals	914	I	2.21	92	34	2,369	124	274.29	233	4,637	0.85	3,929

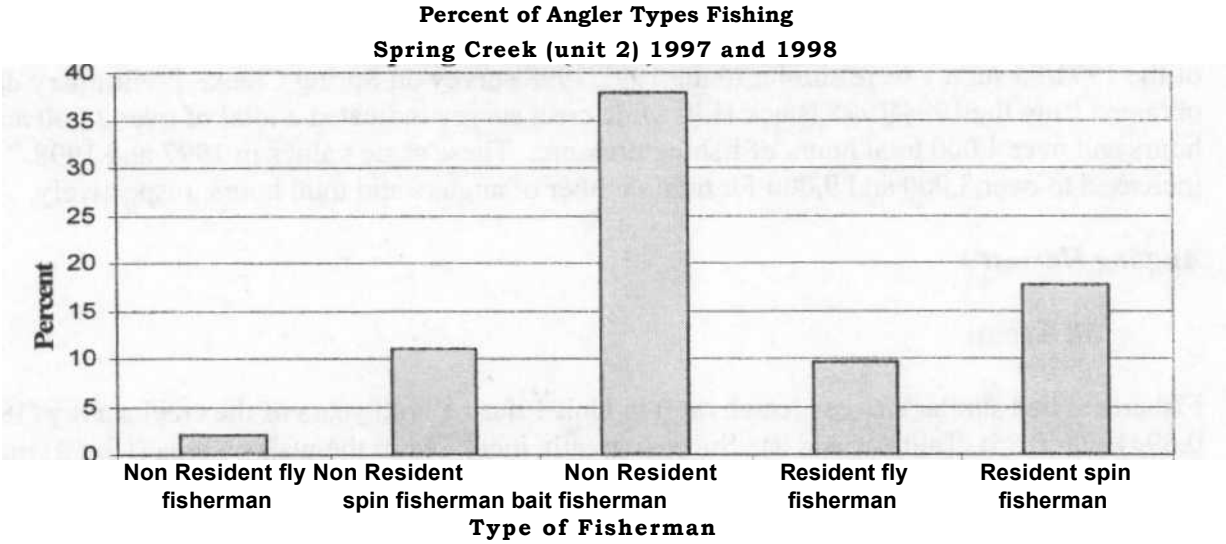

Figure 2. Anglers sorted by type that fished Spring Creek (Unit 2) in 1997 and 1998.

Four hundred sixty-four fishermen were interviewed in Unit 2 of Spring Creek (Tables 3 and 4). Twenty-nine percent of these anglers were nonresidents (Figure 2). This is a value slightly higher than that observed downstream (Figure A). Fly fishermen consisted of 60% of all anglers within that unit. Fishermen using various kinds of organic bait represented 26% of anglers interviewed. The rest of surveyed anglers were spin-fishermen (14%). Overall, a greater proportion of fly fishermen were in Unit 2 (60%) than in Unit 1 (52%). Fly fishermen were the largest users of this resource within the entire area, bait fishermen were second, and spin fishermen were last.

Non-residents had a higher percentage (29%) than those from a Rapid Creek creel survey (19%) (Whitcher and Erickson 1993). This observation indicates that a larger number of non-residents were interviewed in the walk-in portion of the creek. If one assumes a random placing of fishermen, two assumptions are possible; resident fishermen were not willing to venture far from their vehicles or non-residents were more willing to travel for their fishing experience.

Angler Use and Sport Fish Harvest Survey

Angler Use and Preference
Angling Pressure

Estimated total angling pressure for Unit I from June-August in 1997 was 4,890 angler hours compared with 4,637 hours in 1998 (Tables 1 and A). In Unit 2 in the same time period, the angler hours were 4,791 and 4,230. The total number of anglers interviewed and estimated were larger along Sheridan Lake Road (Unit A) than in the walk in area (Unit A) for both creel seasons (Tables 3 and 4). Conversely, the average trip length was longer in the walk-in area than along Sheridan Lake Road for both years. This suggests that anglers who have easy access may be more prone to spend less time fishing or are more mobile.

Comparison with 1994/1995 creel survey

During the summers of 1994 and 1995 a Black Hills wide creel survey was performed. Sections of the 1994/95 survey were similar to the 1997/1998 survey on Spring Creek. Preliminary data obtained from the 1994/1995 Black Hills wide creel survey indicated a total of over 2.000 angler hours and over 4,000 total hours of fishing pressure. These same values in 1997 and 1998 increased to over 3,000 and 9,000 for total number of anglers and total hours, respectively.

Angling Harvest

All Trout

Fishermen had similar success (catch rate) in Unit 1 during both years of the creel survey (19970.89, 1998-0.85) (Tables 1 and A). Success greatly increased in the walk-in area (Unit A) during the creel survey (1997- 0.7, 1998- A.01). The estimated total number of fish caught in Unit 1 was 4,295 in 1997 and 3,929 in 1998. Fish caught in Unit 2 showed an even greater decline between the data years (1997- 4,495, 1998- A,637). Data on catch shows that trout were most often caught during the weekday PM, weekend AM or weekend PM shifts. Lowest catch occurred during the weekday AM shift.

The stated objective for the Black Hills streams states that stream trout populations should have a catch rate of 0.5 trout/hour and a harvest of 75% of hatchery raised trout. Data from Spring Creek indicate that 0.5 trout/ hour was a reachable goal as it was exceeded in each of the four categories.

Brown Trout

The overall catch of brown trout was less in 1998 than in 1997 (Appendix Tables A, A, 4, 6, 13, and 18). The fish caught by interviewed anglers declined in both units from 1997 to 1998 by over 100 fish which in turn decreased the overall calculated number of fish caught. However, both units during the entire creel survey experienced a catch rate of brown trout exceeding the projected Black Hills goal of 0.5 fish per hour. Most brown trout were caught during the weekday PM shift. Lowest catch of brown trout was during the weekday PM shift.

Rainbow Trout

Anglers caught rainbow trout at similar rates in Unit I for the duration of the creel survey (Appendix Tables 10 and 12). In Unit 2, however, a decline in the number of fish caught, catch rate, and expected number of fish caught was observed (Appendix Tables 1 I and 14). A combination of the decline in the number of anglers in Unit 2 and the lower catch of rainbow trout during 1998 contributed to the lower catch rates. Most rainbow trout were caught during the weekday PM shift. Lowest catch of rainbow trout was during the weekday PM shift.

Table 3. Estimated angling pressure and catch rates sorted by shift and month for all trout at Spring Creek, Unit 2 (Spring Creek walk in area) from June 1 - August 31, 1997.

	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM
Month	Count	Interval	ave trip	Days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	45	1	3.40	21	3	93	17	57.75	50	315	0.87	273
July	98	I	2.52	22	3	285	11	27.75	19	719	0.68	492
August	33	I	2.67	21	3	87	11	29.32	56	231	1.91	441

	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM
Month	Count	Interval	ave trip	Days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	83	I	2.58	9	3	97	13	33.50	36	249	1.07	268
July	133	1	2.77	9	3	144	32	88.74	119	399	1.34	535
August	117	1	1.98	10	2	295	26	51.50	48	585	0.93	545

	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM
Month	Count	Interval	ave trip	Days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	64	1	2.82	21	4	119	24	67.75	103	336	1.52	511
July	100	I	2.75	22	4	200	20	55.00	33	550	0.60	330
August	80	1	2.53	21	3	221	29	73.41	70	560	0.95	534

	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM
Month	Count	Interval	ave trip	Days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	35	1	1.50	9	2	105	5	7.50	1	158	0.13	21
July	77	I	3.49	9	2	99	15	52.33	52	347	0.99	344
August	103	I	2.77	10	3	124	34	94.09	55	343	0.58	201

ALL SHIFTS COMBINED FOR 1997 Unit 2 (Spring Creek walk in area)											
Month	Count	Interval	ave trip	# Days In month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish caught
June	227	1	2.82	30	12	413	59	166.5	190	1,058	1.14	1,072
July	408	1	2.87	31	12	728	78	223.82	223	2,014	1.00	1,701
August	333	I	2.48	31	I1	727	100	248.32	229	1,719	0.92	1,721
Totals	968	1	2.69	92	35	1,869	237	638.64	642	4,791	1.01	4,495

Table 4. Estimated angling pressure and catch rates sorted by shift and month for all trout at Spring Creek, Unit 2 (Spring Creek walk in area) from June 1 - August 31 1998.

	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM
Month	Count	Interval	ave trip	Days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	83	1	2.00	22	4	228	17	34.00	25	457	0.74	336
July	79	I	2.24	23	4	203	17	38.00	19	454	0.50	227
August	56	I	2.20	21	3	178	5	11.00	6	392	0.55	214
	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM
Month	Count	Interval	ave trip	Days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	77	1	2.38	8	2	130	20	47.50	56	308	1.18	363
July	58	I	2.77	8	2	84	21	58.25	34	232	0.58	135
August	57	1	1.90	10	3	100	5	9.50	9	190	0.95	180
	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday **PM**	Weekday PM	Weekday PM	Weekday PM	Weekday PM
Month	Count	Interval	ave trip	Days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	64	I	4.59	22	4	77	27	123.92	116	352	0.94	330
July	87	1	2.52	23	3	265	28	70.50	40	667	0.57	378
August	71	I	2.05	21	3	242	30	61.59	17	497	0.28	137
	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM
Month	Count	Interval	ave trip	Days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	37	I	2.45	8	2	60	21	51.50	28	148	0.54	80
July	67	1	2.05	8	2	131	20	41.00	27	268	0.66	176
August	53	I	2.70	10	2	98	16	43.25	13	265	0.30	80

ALL SHIFTS COMBINED FOR 1998 Unit 2 (Spring Creek walkin area)											
Month	Count	Interval	ave trip	# Days In month	# Days Censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish caught
June	261	I	3.02	30	12	495	85	257	225	1,265	0.88	1,109
July	291	1	2.42	31	II	682	86	208	120	1,621	0.58	917
August	237	I	2.24	31	II	618	56	125	45	1,344	0.36	611
Totals	789	1	2.60	92	34	1,796	227	590.01	390	4,230	0.66	2,637

Release Rates

All **Trout**

Units 1 and 2 experienced release rates for all trout of at least 33% in both 1997 and 1998 (Tables 5 and 6). Brook trout experienced the lowest recorded release rate seen in Unit I during 1997 (33%). However, this result is deceiving as there were only three specimens reported. Rainbow trout had a low release rate in 1997 (Unit A). Otherwise, all other time periods and units experienced over 70% release. Release rates peaked in July for Unit 1 in 1997 and in August in 1998. Release rates were highest during June for both years in Unit 2.

Brown Trout

Brown trout were released at rates of at least 81 % during the entire survey (Tables 5 and 6). Both units had high release rates and each was higher during the second year of the survey. In 1997, brown trout were released at the highest rate during July and August for Unit 1 and Unit A, respectively. Data from 1998 showed the highest release rate occurring during June.

Rainbow Trout

Anglers released rainbow trout at different rates during the first year of the survey (Tables 5 and 6). In Unit A, where the stream is easily accessible, the harvest rate was 58% during the 1997 season. This same statistic was reduced in Unit 1 to 20% harvest (80% release) for the second year of the survey. For both years of the creel survey, Unit 1 showed the highest and lowest release rates by relatively significant amounts. Unit 2 had similar release rates of at least 72% during the entire survey. The highest release of rainbow trout occurred during July and June for 1997 and 1998, respectively.

Table 5. Release and harvest of rainbow, brown, and brook trout caught from Spring Creek, Unit 1 (1997-1998).

1997 Catch - Spring Cr. Unit I

JUNE	RBT Caught	RBT Release	RBT Kept	BNT Caught	BNT Release	BNT Kept	BKT Caught	BKT Release	BKT Kept	Total Caught	Total Released	Total Kept
WDAM		0	1	4	3	1	2		2	7	3	4
WDPM	6	2	4	41	32	9	0	0	0	47	34	13
WEAM	3	1	2	14	12	2	0	0	0	17	13	4
WEPM	3	1	2	20	14	6	0	0	0	23	15	6
TOTAL	**13**	**4**	9	**79**	**61**	**18**	**2**		2	94	65	29
JULY												
WDAM	5		5	20	15		0	0	0	25	15	10
WDPM	3	2	1	10	9	1	0	0	0	13	11	2
WEAM	**14**	6	8	58	55	3	0		0	72	61	11
WEPM	7	5	2	33	24	9	1	1	0	41	30	11
TOTAL	**29**	13	16	121	103	**18**	1	1	0	151	117	34
AUGUST												
WDAM		0	0			0		0	0	0	0	0
WDPM	4	2	2	27	25	2	0	0	0	31	27	4
WEAM	0	0	0	6	6	0	0	0	0	6	6	0
WEPM	16	7	9	48	34	14	0	0		64	41	23
TOTAL	**20**	**9**	**11**	**81**	**65**	**16**	**0**	**0**	0	101	74	27
Grand TOTAL	**62**	**26**	**36**	**281**	**229**	**S2**	3	1	**2**	**346**	**256**	**90**

Species	Rainbow	%	Brown	%	Brook	%
Caught	62		281		3	
Released	26	42%	229	81%		33
Harvested	36	58%	52	19%		67

1998 Catch - Spring Cr. Unit I

JUNE	Caught	RBT Release	RBT Kept	Cauqht	BNT Release	BNT Kept	Cauqht	BKT Release	BKT Kept	Caught	Total Released	Total Kept
WDAM			2	34	34	0		0	0	42	40	2
WDPM	25	22	3	69	65	4	1	1	0	95	88	7
WEAM	3	2	1	2	1	1	0	0	0	5	3	2
WEPM	1	1	0	6	5	1	0	0	0	7	6	1
TOTAL	37	31		111	105		1	1	0	149	137	12
JULY												
WDAM	0	0		0	0		0	0	0	0	0	0
WDPM	4	4	0	4	2	2	0	0	0	8	6	2
WEAM	2	2	0	22	22	0	0	0	0	24	24	0
WEPM	3	1	2	15	11	4	0	0	0	18	12	6
TOTAL	9	7		41	35	6	0	0	0	50	**42**	8
AUGUST												
WDAM	7	5	2	5	4	1	0	0	0	12	9	3
WDPM	2	1	1	5	5	0	0	0	0	7	6	1
WEAM	1	1	0	11	10	1	0	0	0	12	11	1
WEPM	0	0	0	3	3	0	0	0	0	3	3	0
TOTAL	10	7		24	22	2	0	0	0	34	29	5
Grand TOTAL	**56**	45	11	176	162	**14**	1	1	**0**	**233**	**208**	**25**

Species	Rainbow	%	Brown	%	Brook	%
Caught	56		176		1	
Released	45	80%	162	92%	1	100
Harvested	11	*20%*	14	8 %	0	0%

Table 6. Release and harvest of rainbow, brown, and brook trout caught from Spring Creek, Unit 2 (1997-1998).

1997 Catch - Spring Cr. Unit 2

	RBT			BNT			BKT			Totals		
JUNE	Caught	Release	Kept	Caught	Release	Kept	Caught	Release	Kept	Caught	Release	Kept
WDAM	17	8	9	33	16	17	0	0	0	50	24	26
WDPM	14	4	10	88	61	27	1	1	0	103	66	37
WEAM	17	10	7	19	16	3	0	0	0	36	26	10
WEPM	0	0	0	1	1	0	0	0	0	1	1	0
TOTAL	**48**	**22**	**26**	141	**94**	**47**	1	1	0	190	117	73
JULY												
WDAM	3	1	2	16	15	1	0	0	0	19	16	3
WDPM	9	8	1	24	20	4	0	0	0	33	28	5
WEAM	44	30	14	75	67	8	0	0	0	119	97	22
WEPM	29	29	0	23	23	0	0	0	0	52	52	0
TOTAL	**85**	**68**	17	138	**125**	13	0	0	0	223	193	30
AUGUST												
WDAM	10	10	0	46	46	0	0	0	0	56	56	0
V1DPM	18	18	0	52	51	1	0	0	0	70	69	1
1/VEAM	6	2	4	42	35	7	0	0	0	48	37	11
VuEPM	29	21	8	26	19	7	0	0	0	55	40	15
TOTAL	63	51	12	**166**	151	15	0	0	0	229	202	27
Grand TOTAL ~	196	141	**55**		370	75	1	1	0	642	512	130

Species	**Rainbow**	%	**Brown**	%	**Brook**	
Caught	196		445		1	
Released	141	72%	370	83%	1	100%
Harvested	55	28%	75	17%		0%

1998 Catch - Spring Cr. Unit 2

	RBT			BNT			BKT			Totals		
JUNE	**Caught**	**Release**	**Kept**	Caught	Release	Kept	Caught	Release	Kept	Caught	Release	Kept
WDAM	4		0	20	19	1	1	1	0	25	24	1
VuDPM	15	11	4	96	93	3	5	5	0	116	109	7
WElVv1	9	7	2	47	37	10	0	0	0	56	44	12
VVEPM	5	2	3	23	21	2	0	0	0	28	23	5
TOTAL	33	24	9	186	170	16	6	6	0	225	200	25
JULY												
WDAM	3	2	1	15	14	1	1	1	0	19	17	2
VNDPM	4	1	3	34	32	2	2	2	0	40	35	5
VNEAM	4	4	0	30	26	4	0	0	0	34	30	4
WEPM	5	4	1	20	19	1	2	2	0	27	25	2
TOTAL	16	11	5	99	91	8	5	5	0	120	107	13
AUGUST												
VNDAM	1	0	1	5	5	0	0	0	0	6	5	1
	8	7	1	9	7	2	0	0	0	17	14	3
WEAM	0	0	0	9	5	4	0	0	0	9	5	4
VVEPM	3	3		10	10	0		0	0	13	13	0
TOTAL	12	10	2	33	27	6	0	0	0	45	37	8
Grand TOTAL	61	45	16	318	288	30	11	11	0	390	344	46

Species	Rainbow	%	Brown	%	Brook	%
Caught	61		318		11	
Released	45	74%	**288**	91%	11	100%
Harvested	16	26%		9%	0	0%

Table 7. Percent return of brown trout to creel from Spring Creek, Unit 1 (Sheridan Lake Road to walk in area) from 1997 and 1998.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observe	Total Catch	Estimated Return to Creel	Percent* Return to Creel
31-Mar-97	FR	Right Front	625	2	2%	155	22	3.5%
19-May-97	LF	Left Front	626	7	8%	542	76	12.1%
23-Jun-97	RR	Right Rear	626	2	2%	155	22	3.5%
14-Jul-97	LR	Left Rear	424	3	4%	232	33	7.7%
12-Aug-97	UCH	Upper Caudal	426	3	4%	232	33	7.6%
01-Apr-98	ARV	Adipose & Right Front	625	0	0%	0	0	0.0%
26-May-98	ARV	Adipose & Right Rear	623	1	1%	77	11	1.7%
20-Jul-98	ALF	Adipose & Left Front	424	1	1%	77	11	2.6%
04-Aug-98	ALR	Adipose & Left Rear	425	0	0%	0	0	0.0%
26-Aug-98	AUK	Adipose & Upper Caudal	424	0	0%	0	0	0.0%
	NC	No Clip		36	43%	2,787	390	NA
	UK	Unknown		3	4%	232	33	NA
	W	Wild		25	30%	1,935	271	NA
		Totals	5,248	83	100%	6,425		4.0%

* Overall percent return based on known dips.

1997&1998 Estimates
Estimated BNT Catch = 6,425
Harvest = 14%
Released = 86%

Table 8. Percent return of brown trout to creel from Spring Creek, Unit 2 (Spring Creek walk-in area) from 1997 and 1998.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
31-Mar-97	RV	Right Front	625	2	2%	96	13	2.1%
19-May-97	LTV	Left Front	626	9	8%	431	60	9.6%
23-Jun-97	RR	Right Rear	626	8	7%	383	54	8.6%
14-Jul-97	LR	Left Rear	424	4	4%	191	27	6.3%
12-Aug-97	LIC	Upper Caudal	426	3	3%	144	20	4.7%
01-Apr-98	ARV	Adipose & Right Front	625	1	1%	48	7	1.1%
26-May-98	ARR	Adipose & Right Rear	623	4	4%	191	27	4.3%
20-Jul-98	ALF	Adipose & Left Front	424	1	1%	48	7	1.6%
04-Aug-98	ALR	Adipose & Left Rear	425	0	0%	0	0	0.0%
26-Aug-98	AUK	Adipose & Upper Caudal	424	0	0%	0	0	0.0%
	NC	No Clip		39	35%	1,867	261	NA
	UK	Unknown		6	5%	287	40	NA
	W	Wild		36	32%	1,723	241	NA
	Totals		5,248	113	100%	5,409		4.1%

* Overall percent return based on known dips.

1997&1998 Estimates
Estimated BNT Catch =5,409
Harvest = 14%
Released = 86%

Stocking Success

Fin clips were used to determine the effectiveness of stocking large rainbow trout. In addition, contributions to the fishery by specific stockings were also of interest. Results of these stockings showed that 28% of stocked brown trout from Unit I were never observed (Table 7). In Unit A, the same statistic was 16% (Table 8). Forty percent and 29% of rainbow trout were never seen during the creel survey in Units I and 2, respectively (Tables 9 and 10). Results of the fin clip returned fish are most probably misleading. Potential problems with the creel clerk's ability to correctly determine the fin clips likely contributed to the poor returns. However, the results do show that there were no fish caught from the April or August stockings. Since the creel survey didn't start until June, it is possible that the April fish were "caught out" before the clerk's first creel date. As for the August stockings, clerks were present but the poor return may indicate that few fish survived for any length of time. Elevated water temperatures may potentially be the cause of the poor return.

The stated goal for return of stocked catchable fish is 75% (Erickson et al, 1993). Rainbow trout and brown trout from Spring Creek were both behind this stated goal (Tables 9 and 10).

Table 9. Percent return of rainbow trout to creel from Spring Creek, Units I and 2 from 1997 and 1998.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
31-Mar-97	FR	Right Front	350	6	4%	185	63	18%
19-May-97	LF	Left Front	500	19	12%	532	181	36%
23-Jun-97	RR	Right Rear	500	25	16%	752	256	51%
14-Jul-97	LR	Left Rear	500	10	6%	367	125	25%
12-Aug-97	UCH	Upper Caudal	500	7	4%	221	75	15%
01-Apr-98	ARV	Adipose & Right Front	346	0	0%	0	0	0%
26-May-98	ARR	Adipose & Right Rear	496	5	3%	160	54	11%
20-Jul-98	ALF	Adipose & Left Front	496	2	1 %	50	17	3%
04-Aug-98	ALR	Adipose & Left Rear	502	0	0%	0	0	0%
26-Aug-98	AUK	Adipose & Upper Caudal	522	0	0%	0	0	0%
	NC	No Clip	0	32	20%	880	299	NA
	UK	Unknown	0	5	3%	172	58	NA
	W	Wild	2,356	49	31%	1773	603	NA
		Totals	4,712	160	100%	1,646	1731	16%

Table 10. Percent return of brown trout to creel from Spring Creek, Units 1 and 2 from 1997 and 1998.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
31-Mar-97	FR	Right Front	1,250	4	2%	251	35	3%
19-May-97	LF	Left Front	1,252	16	8%	973	136	11%
23-Jun-97	RR	Right Rear	1,252	10	5%	538	75	6%
14-Jul-97	LR	Left Rear	848	7	4%	424	59	7%
12-Aug-97	UCH	Upper Caudal	852	6	3%	376	53	6%
01 -Apr-98	ARV	Adipose & Right Front	1,250	1	1%	48	7	1%
26-May-98	ARR	Adipose & Right Rear	1,246	5	3%	269	38	3%
20-Jul-98	ALF	Adipose & Left Front	848	2	1%	125	18	2%
04-Aug-98	ALR	Adipose & Left Rear	850	0	0%	0	0	0%
26-Aug-98	AUK	Adipose & Upper Caudal	848	0	0%	0	0	0%
	NC	No Clip	0	75	38%	4654	651	NA
	UK	Unknown	0	9	5%	519	73	NA
	W	Wild	0	61	31%	3658	512	NA
		Totals	10,496	196	100%	11,834	1657	4%

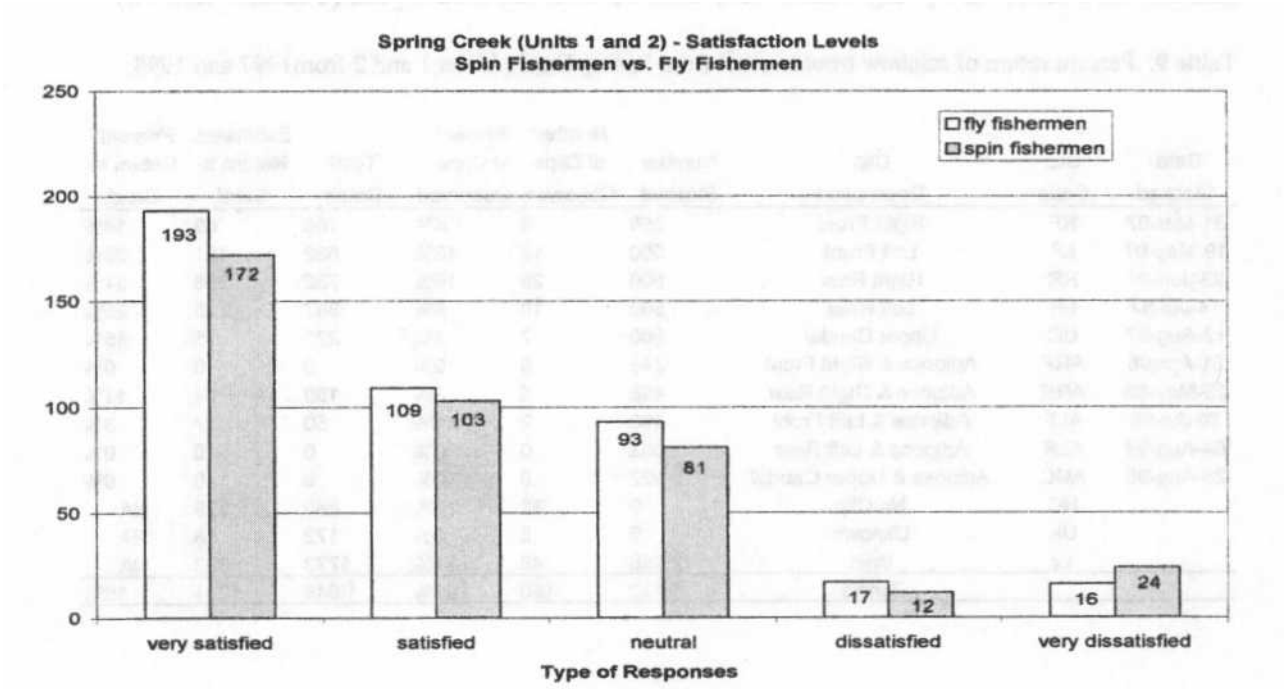

Figure 3. Angler satisfaction reported at Spring Creek, Units I and 2 from 1997-1998 separated by fly fishermen and spin fishermen.

Angler Satisfaction

A new topic of concern to fisheries managers is the satisfaction of the angler. How satisfied an angler is can be important towards determining acceptance of regulations and can reveal how the managing agency is performing. Recent creel surveys address this subject by asking how satisfied the anglers were with the day's trip. When this question was asked of anglers fishing Spring Creek, 45% of respondents were very satisfied, 26% were satisfied, and 21 % were neutral (Figure 3). The remaining 8% were dissatisfied with the day's fishing experience. Currently, no stated goals for angler satisfaction exist within the Black Hills. For this study, 71 % of anglers were at least satisfied with the days fishing experience. Since no objectives were stated in respect to angler satisfaction, any presumption of success may be inaccurate. Comparisons within units showed little difference between satisfaction levels (Figures 4 and 5). Trends in the overall level of satisfaction are similar to those from each individual unit.

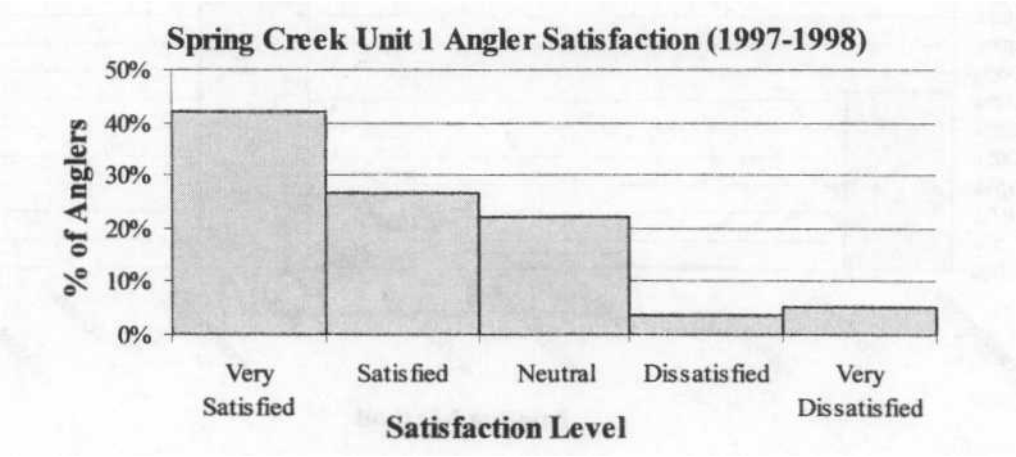

Figure 4. Angler satisfaction from Spring Creek, Unit 1 (1997-1998).

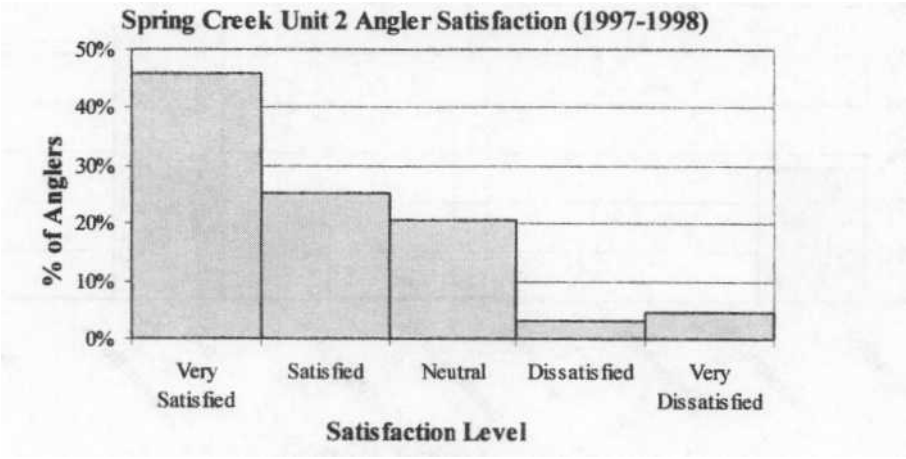

Figure 5. Angler satisfaction from Spring Creek, Unit 2 (1997-1998).

Angler Preference and Attitude Survey

Angling Method

Anglers were identified about the type of fishing they were pursuing. Terminal tackle was identified during interviews. Fishermen were grouped into one of three generalized types; bait fishermen, spin fishermen, and fly fishermen. In Unit 1, 36% of anglers fishing Spring Creek were using some variety of bait (Figure 6). At this same period, spin fishermen comprised 17% and fly-fishermen 47%. Total percentages of angler types fishing Spring Creek in Unit 2 changed slightly to 29% bait, 15% spin, and 55% fly (Figure 7).

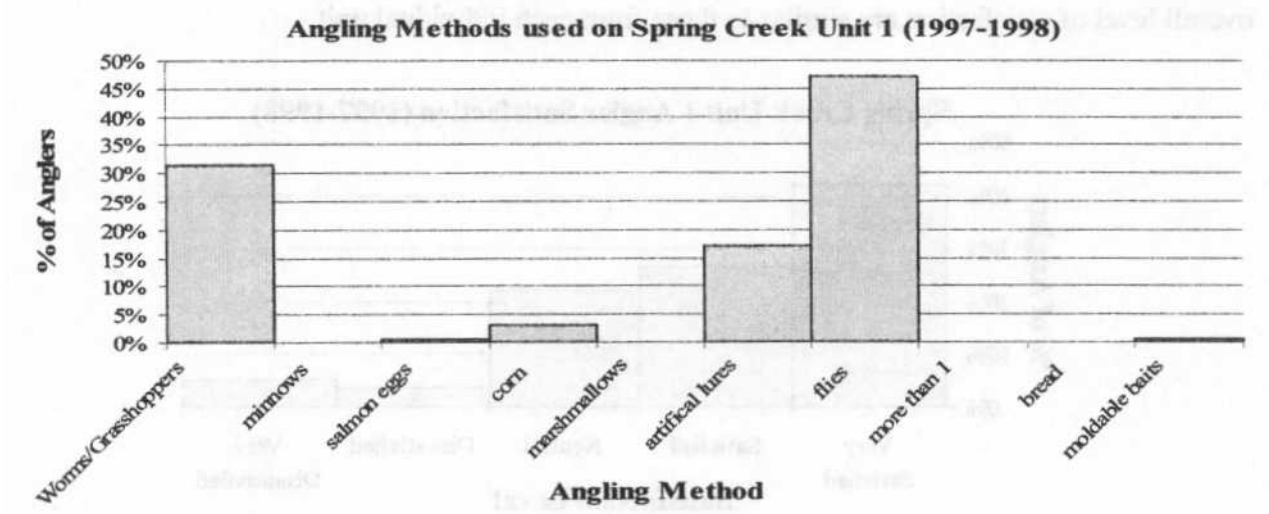

Figure 6. Angling methods used in Spring Creek, Unit I (1997-1998).

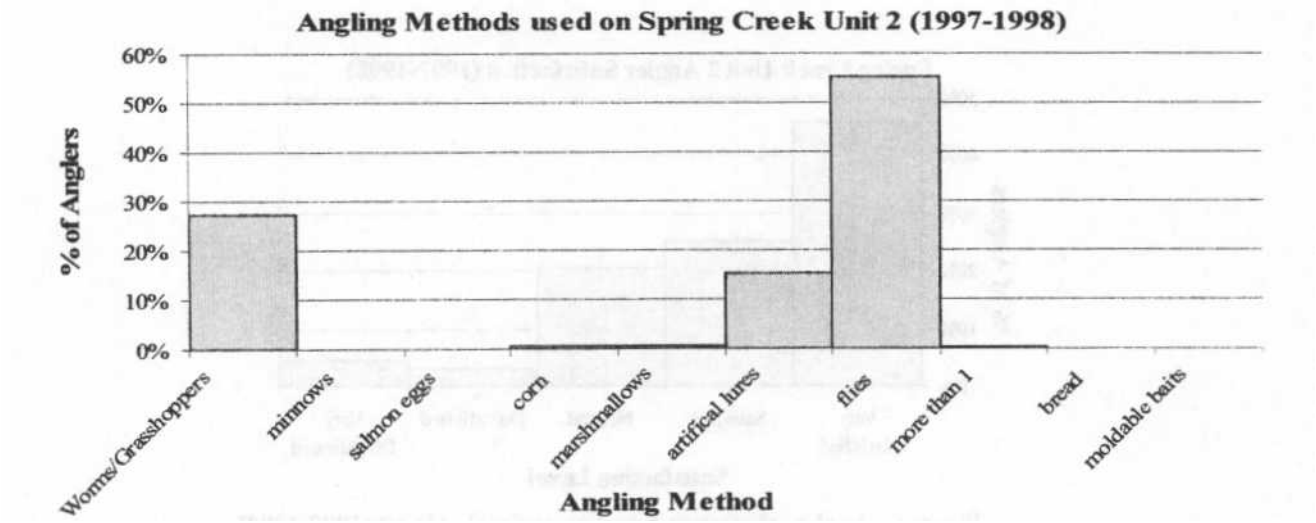

Figure 7. Angling methods used in Spring Creek, Unit 2 (1997-1998).

RECOMMENDATIONS

5-year Management Plan

- Continue stocking large rainbow trout at prescribed locations in Section 3 of Spring Creek. Two-hundred and fifty of these trout are to be stocked at bridges and access points except for the August stocking which should be one-hundred seventy five fish. These stockings are to occur at the times specified in the Annual Coldwater Stocking Schedule.
- Contingency plans for the stocking of rainbow trout in the case of drought or low water conditions in Section 3 of Spring Creek will be to stock large rainbows in lakes suitable for their survival.
- Monitor fish populations at the following locations and times:

    - Year 2000
        - Site #14 -Monitor BNT wild trout area
        - Site #13 - Study effects of stream improvements with highway construction
        - Site #I 1 - Monitor BNT and warmwater species
        - Site #A - Monitor BNT populations and check survival of RBT

    - Year 2001
        - Site #10 - Monitor BNT population and check survival of RBT
        - Site #8 - Monitor BNT population
        - Site #A - Monitor BNT and check survival of RBT

    - Year 2002
        - Site # 13 - Study effects of stream
        - Site #1 - Monitor BNT populations and check survival of RBT
        - Site #12 Monitor BNT population

    - Year 2003
        - Site #14 - Monitor BNT wild trout area
        - Site #11 - Monitor BNT and warmwater species

    - Year 2004
        - Site #10 - Monitor BNT population and check survival of RBT
        - Site #2 - Monitor BNT and check survival of RBT
        - Site #8 - Monitor BNT population
        - Site #13 - Study effects of stream
        - Site # 1 - Monitor BNT populations and check survival of RBT

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APPENDIX A

SPRING CREEK ROUTE (SPRC)

Date _____ AM or **PM Route** **Clerk Name** _____
(DD/MM/YY) **(circle one)**

	Leg Name	Unit	**Unit Description**	Time	# Fly	# **Spin**	# Unknown
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	7:00 AM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	7:00 AM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	8:00 AM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	8:00 AM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	9:00 AM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	9:00 AM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	10:00 AM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	10:00 AM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	11:00 AM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	11:00 AM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	12:00 PM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	12:00 PM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	1:00 PM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	1:00 PM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	2:00 PM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	2:00 PM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	3:00 PM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	3:00 PM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	4:00 PM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	4:00 PM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	5:00 PM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	5:00 PM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	6:00 PM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	6:00 PM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	7:00 PM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	7:00 PM			
1	Below Sheridan Lake	1	Sheridan Lake Road to Walk-in Area	8:00 PM			
1	Below Sheridan Lake	2	Sheridan Lake Walk-in Area	8:00 PM			

Comments on Weather Conditions, ETC:

Appendix Figure 1. Copy of the field pressure form used during the 1997 and 1998 Spring Creek Creel Survey.

Appendix Table 1. Percent of brown trout return to creel at Spring Creek, Unit 1 (Sheridan Lake Road to Walk-in area) from June 1-August 31, 1997.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
31-Mar-97	RF	Right Front	625	2	3%	103	20	3.1
19-May-97	LF	Left Front	626	5	7%	258	49	7.8%
23-Jun-97	RR	Right Rear	626	2	3%	103	20	3.1%
14-Jul-97	LR	Left Rear	424	3	4%	155	29	6.9%
12-Aug-97	UC	Upper Caudal	426	2	3%	103	20	4.6%
	NC	No Clip		31	46%	1,602	304	NA
	UK	Uknown		2	3%	103	20	NA
	W	Wild		21	31%	1,086	206	
		Totals	2,727	68	100%	3,515		5.1%

* Overall percent return based on known clips.

1997 Estimates
Estimated BNT Catch = 3,515
Harvest = 19%
Released = 81

Appendix Table 2. Percent of rainbow trout return to creel at Spring Creek, Unit I (Sheridan Lake Road to Walk-in area) from June 1-August 31, 1997.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
31-Mar-97	RF	Right Front	175	2	6%	40	23	13.1%
19-May-97	LF	Left Front	250	5	14%	99	57	22.9%
23-Jun-97	RR	Right Rear	250	9	25%	178	103	41.2%
14-Jul-97	LR	Left Rear	250	10	28%	198	115	45.8%
12-Aug-97	UC	Upper Caudal	250	3	8%	59	34	13.7%
	NC	No Clip		6	17%	119	69	NA
	UK	Uknown		1	3%	20	11	NA
		Totals	1,175	36	100%	711		12.4%

* Overall percent return based on known dips.

1997 Estimates
Estimated RBT Catch = 711
Harvest = 58%
Released = 42%

Appendix Table 3. Percent of brown trout return to creel at Spring Creek, Unit 2 (Spring Creek Walk-in area) from June 1-August 31, 1997.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
31-Mar-97	RF	Right Front	625	0	0%	0	0	0.0%
19-May-97	LF	Left Front	626	3	4%	127	22	3.4%
23-Jun-97	RR	Right Rear	626	2	3%	85	14	2.3%
14-Jul-97	LR	Left Rear	424	2	3%	85	14	3.4%
12-Aug-97	UC	Upper Caudal	426	1	1%	42	7	1.7%
	NC	No Clip		30	39%	1,268	216	NA
	W	Wild		39	51%	1,648	280	NA
		Totals	2,727	77	100%	3,254		2.1%

* Overall percent return based on known dips.

1997 Estimates
Estimated BNT Catch = 3,254
Harvest = 17%
Released = 83%

Appendix Table 4. Percent of brown trout return to creel at Spring Creek, Unit 1 (Sheridan Lake Road to Walk-in area) from June 1-August 31, 1998.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
01-Apr-98	ARF	Adipose & Right Front	625	0	0%	0	0	0.0%
26-May-98	ARR	Adipose & Right Rear	623	1	8%	243	19	3.1%
20-Jul-98	ALF	Adipose & Left Front	424	1	8%	243	19	4.6%
04-Aug-98	ALR	Adipose & Left Rear	425	0	0%	0	0	0.0%
26-Aug-98	AUC	Adipose & Upper Caudal	424	0	0%	0	0	0.0%
	NC	No Clip		5	**42%**	1,213	97	NA
	UK	Uknown		1	8%	243	19	NA
	W	Wild		4	33%	970	78	NA
		Totals	2,521	12	100%	2,910		1.5%

* Overall percent return based on known clips.

1998 Estimates
Estimated BNT Catch = 2,910
Harvest = 8%
Released = 92%

Appendix Table 5. Percent of rainbow trout return to creel at Spring Creek, Unit I (Sheridan Lake Road to Walk-in area) from June 1-August 31, 1998.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
01-Apr-98	ARF	Adipose & Right Front	173	0	0%	0	0	0.0%
26-May-98	ARR	Adipose & Right Rear	248	3	43%	434	87	35.0%
20-Jul-98	ALF	Adipose & Left Front	248	0	0%	0	0	0.0%
04-Aug-98	ALR	Adipose & Left Rear	251	0	0%	0	0	0.0%
26-Aug-98	AUC	Adipose & Upper Caudal	261	0	0%	0	0	0.0%
	NC	No Clip		1	14%	145	29	NA
	UK	Uknown		3	43%	434	87	NA
		Totals	1,181	7	100%	1012		7.4%

" Overall percent return based on known clips.

1998 Estimates
Estimated RBT Catch = 1,012
Harvest =20%
Released = 80%

Appendix Table 6. Percent of brown trout return to creel at Spring Creek, Unit 2 (Spring Creek Walk-in area) from June 1-August 31, 1998.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
01-Apr-98	ARF	Adipose & Right Front	625	1	5%	103	9	1.5%
26-May-98	ARR	Adipose & Right Rear	623	3	14%	308	28	4.4%
20-Jul-98	ALF	Adipose & Left Front	424	0	0%	0	0	0.0%
04-Aug-98	ALR	Adipose & Left Rear	425	0	0%	0	0	0.0%
26-Aug-98	AUC	Adipose & Upper Caudal	424	0	0%	0	0	0.0%
	NC	No Clip		3	14%	308	28	NA
	UK	Uknown		3	14%	308	28	NA
	W	Wild		11	52%	1,129	102	NA
		Totals	2,521	21	100%	2,155		1.5%

" Overall percent return based on known clips.

1998 Estimates
Estimated BNT Catch = 2,155
Harvest = 9%
Released = 91

Appendix Table 7. Stocking dates and clip codes of brown and rainbow trout stocked into Spring Creek during 1997 and 1998.

Spring Cr. 1997		Brown Trout Stockings					Clip Codes 1997	
Date	Trout / lb.	Tot. lbs.	Number	Clip		1	RF	Right front
31-Mar-97			625	RF		2	LF	Left front
19-May-97	2.82	222.00	626	LF		3	RR	Right rear
23-Jun-97	2.30	272.00	626	RR		4	LR	Left rear
14-Jul-97	1.67	254.00	424	LR		5	UC	Upper cauc
12-Aug-97	1.82	234.00	426	UC		6	NC	No clip
			2,727					

Spring Cr. 1997		Rainbow Trout Stockings		
Date	Trout / lb.	Tot. lbs.	Number	Clip
31-Mar-97			175	RF
19-May-97	0.50	500.44	250	LF
23-Jun-97	0.36	690.04	250	RR
14-Jul-97	0.37	213.41	250	LR
12-Aug-97	0.45	551.15	250	UC
			1,175	

Spring Creek Brown Trout Stockings 1998				
Date	Fish/lb	Tot. lbs	Number	Clip
01-Apr-98	2.73	229	625.17	ARF
26-May-98	1.86	335	623.1	ARR
20-Jul-98	2.09	203	424.27	ALF
04-Aug-98	1.95	218	425.1	ALR
26-Aug-98	0.96	442	424.32	AUC
			2521.96	

Spring Creek Rainbow Trout Stockings 1998				
Date	Fish/lb	Tot. lbs	Number	Clip
01-Apr-98	0.45	385	173.25	ARF
26-May-98	0.33	753	248.49	ARR
20-Jul-98	0.45	550	247.5	ALF
04-Aug-98	0.41	611	250.51	ALR
26-Aug-98	0.5	521	260.5	AUC

Appendix Table 8. Estimated angling pressure and catch rates sorted by shift and month for brown trout at Spring Creek, Unit 2 (Spring Creek Walk-in area) from June 1-August 31, 1997.

Weekday AM interval	Weekday AM ave trip	Weekday AM days/month	Weekday AM # censused	Weekday AM # anglers	Weekday AM # interviewed	Weekday AM intv. hours	Weekday AM fish caught	Weekday AM total hours	Weekday AM fish/hr.	Weekday AM total catch
1	3.40	21	3	93	17	57.75	33	315	0.57	180
1	2.52	22	3	285	11	27.75	16	719	0.58	414
1	2.67	21	3	87	11	29.32	46	231	1.57	362

Weekend AM interval	Weekend AM ave trip	Weekend AM days/month	Weekend AM # censused	Weekend AM # anglers	Weekend AM # interviewed	Weekend AM intv. hours	Weekend AM fish caught	Weekend AM total hours	Weekend AM fish/hr.	Weekend AM total catch
1	2.58	9	3	97	13	33.50	19	249	0.57	141
1	2.77	9	3	144	32	88.74	75	399	0.85	337
1	1.98	10	2	295	26	51.50	42	585	0.82	477

Weekday PM interval	Weekday PM ave trip	Weekday PM days/month	Weekday PM # censused	Weekday PM # anglers	Weekday PM # interviewed	Weekday PM intv. hours	Weekday PM fish caught	Weekday PM total hours	Weekday PM fish/hr.	Weekday PM total catch
1	2.82	21	4	119	24	67.75	88	336	1.30	436
1	2.75	22	4	200	20	55.00	24	550	0.44	240
1	2.53	21	3	221	29	73.41	52	560	0.71	397

Weekend PM interval	Weekend PM ave trip	Weekend PM days/month	Weekend PM # censused	Weekend PM # anglers	Weekend PM # interviewed	Weekend PM intv. hours	Weekend PM fish caught	Weekend PM total hours	Weekend PM fish/hr.	Weekend PM total catch
1	1.50	9	2	105	5	7.50	1	158	0.13	21
1	3.49	9	2	99	15	52.33	23	347	0.44	152
1	2.77	10	3	124	34	94.09	26	343	0.28	95

ED FOR 1997 Unit 2 (Spring Creek walk in area)

interval	ave trip	# Days in month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish caught
1	2.82	30	12	413	59	166.5	141	1,058	0.85	779
1	2.87	31	12	728	78	223.82	138	2,014	0.62	1,144
1	2.48	31	11	727	100	248.32	166	1,719	0.67	1,331
1	2.69	92	35	1,869	237	638.64	445	4,791	0.70	3,254

Appendix Table 9. Estimated angling pressure and catch rates sorted by shift and month for brown trout at Spring Creek, Unit I (Sheridan Lake Road to Walk-in area) from June 1-August 31, 1997.

	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	44	1	1.43	21	3	216	7	10.00	4	308	0.40	123
July	72	1	2.83	22	3	186	10	28.33	20	528	0.71	373
August	16	1	1.23	21	3	91	8	9.83	0	112	0.00	0

	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	96	1	2.20	9	3	131	15	33.06	14	288	0.42	122
July	119	1	2.72	9	3	131	20	54.33	58	357	1.07	381
August	65	1	1.90	10	2	171	5	9.50	6	325	0.63	205

	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	87	1	2.46	21	4	186	22	54.08	41	457	0.76	346
July	75	1	1.69	22	4	244	13	22.00	10	413	0.45	188
August	95	1	2.52	21	3	264	15	37.75	27	665	0.72	476

	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	102	1	1.27	9	2	361	12	15.26	20	459	1.31	602
July	110	1	2.69	9	2	184	23	61.96	33	495	0.53	264
August	145	1	2.42	10	3	200	22	53.25	48	483	0.90	436

All shift combined for 1997 unit 1 (Sheridan Lake Road to walk in area)

Month	count	interval	ave trip	# Days in month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish cauqht
June	329	1	2.01	30	12	893	56	112.4	79	1,512	0.70	1,193
July	376	1	2.52	31	12	745	66	166.62	121	1,793	0.73	1,205
August	321	1	2.21	31	11	726	50	110.33	81	1,585	0.73	1,117
Totals	1,026	1	2.26	92	35	2,364	172	389.35	281	4,890	0.72	3,515

Appendix Table 10. Estimated angling pressure and catch rates sorted by shift and month for rainbow trout at Spring Creek, Unit I (Sheridan Lake Road to Walk-in area) from June 1-August 31, 1997.

Month	Weekday AM count	Weekday AM interval	Weekday AM ave trip	Weekday AM days/month	Weekday AM # censused	Weekday AM # anglers	Weekday AM # interviewed	Weekday AM intv. hours	Weekday AM fish caught	Weekday AM total hours	Weekday AM fish/hr.	Weekday AM total catch
June	44	1	1.43	21	3	216	7	10.00	1	308	0.10	31
July	72	1	2.83	22	3	186	10	28.33	5	528	0.18	93
August	16	1	1.23	21	3	91	8	9.83	0	112	0.00	0

Month	Weekend AM count	Weekend AM interval	Weekend AM ave trip	Weekend AM days/month	Weekend AM # censused	Weekend AM # anglers	Weekend AM # interviewed	Weekend AM intv. hours	Weekend AM fish caught	Weekend AM total hours	Weekend AM fish/hr.	Weekend AM total catch
June	96	1	2.20	9	3	131	15	33.06	3	288	0.09	26
July	119	1	2.72	9	3	131	20	54.33	14	357	0.26	92
August	65	1	1.90	10	2	171	5	9.50	0	325	0.00	0

Month	Weekday PM count	Weekday PM interval	Weekday PM ave trip	Weekday PM days/month	Weekday PM # censused	Weekday PM # anglers	Weekday PM # interviewed	Weekday PM intv. hours	Weekday PM fish caught	Weekday PM total hours	Weekday PM fish/hr.	Weekday PM total catch
June	87	1	2.46	21	4	186	22	54.08	6	457	0.11	51
July	75	1	1.69	22	4	**244**	13	22.00	3	413	0.14	56
August	95	1	2.52	21	3	264	15	37.75	4	665	0.11	70

Month	Weekend PM count	Weekend PM interval	Weekend PM ave trip	Weekend PM days/month	Weekend PM # censused	Weekend PM # anglers	Weekend PM # interviewed	Weekend PM intv. hours	Weekend PM fish caught	Weekend PM total hours	Weekend PM fish/hr.	Weekend PM total catch
June	102	1	1.27	9	2	361	12	15.26	3	459	0.20	90
July	110	1	2.69	9	2	184	23	61.96	7	495	0.11	56
August	145	1	2.42	10	3	200	22	53.25	16	483	0.30	145

ALL SHIFTS COMBINED FOR 1997 Unit 1 (Sheridan Lake Road to walk in area)

Month	count	interval	ave trip	# Days in month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish caught
June	329	1	2.01	30	12	893	56	112.4	13	1,512	0.12	198
July	376	1	2.52	31	12	745	66	166.62	29	1,793	0.17	297
August	321	1	2.21	31	11	726	50	110.33	20	1,585	0.18	216
Totals	1,026	1	2.26	92	35	2,364	172	389.35	62	4,890	0.16	711

Appendix Table 11. Estimated angling pressure and catch rates sorted by shift and month for rainbow trout at Spring Creek, Unit 2 (Spring Creek Walk-in area) from June 1-August 31, 1997.

Month	Weekday AM count	Weekday AM interval	Weekday AM ave trip	Weekday AM days/month	Weekday AM # censused	Weekday AM # anglers	Weekday AM # interviewed	Weekday AM intv. hours	Weekday AM fish caught	Weekday AM total hours	Weekday AM fish/hr.	Weekday AM total catch
June	45	1	3.40	21	3	93	17	57.75	17	315	0.29	93
July	98	1	2.52	22	3	285	11	27.75	3	719	0.11	78
August	33	1	2.67	21	3	87	11	29.32	10	231	0.34	79

Month	Weekend AM count	Weekend AM interval	Weekend AM ave trip	Weekend AM days/month	Weekend AM # censused	Weekend AM # anglers	Weekend AM # interviewed	Weekend AM intv. hours	Weekend AM fish caught	Weekend AM total hours	Weekend AM fish/hr.	Weekend AM total catch
June	83	1	2.58	9	3	97	13	33.50	17	249	0.51	126
July	133	1	2.77	9	3	144	32	88.74	44	399	0.50	198
August	117	1	1.98	10	2	295	26	51.50	6	585	0.12	68

Month	Weekday PM count	Weekday PM interval	Weekday PM ave trip	Weekday PM days/month	Weekday PM # censused	Weekday PM # anglers	Weekday PM # interviewed	Weekday PM intv. hours	Weekday PM fish caught	Weekday PM total hours	Weekday PM fish/hr.	Weekday PM total catch
June	64	1	2.82	21	4	119	24	67.75	14	336	0.21	69
July	100	1	2.75	22	4	200	20	55.00	9	550	0.16	90
August	80	1	2.53	21	3	221	29	73.41	18	560	0.25	137

Month	Weekend PM count	Weekend PM interval	Weekend PM ave trip	Weekend PM days/month	Weekend PM # censused	Weekend PM # anglers	Weekend PM # interviewed	Weekend PM intv. hours	Weekend PM fish caught	Weekend PM total hours	Weekend PM fish/hr.	Weekend PM total catch
June	35	1	1.50	9	2	105	5	7.50	0	158	0.00	0
July	77	1	3.49	9	2	99	15	52.33	29	347	0.55	192
August	103	1	2.77	10	3	124	34	94.09	29	343	0.31	106

ALL SHIFTS COMBINED FOR 1997 Unit 2 (Spring Creek Walk in area)

Month	count	interval	ave trip	# Days in month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish caught
June	227	1	2.82	30	12	413	59	166.5	48	1,058	0.29	289
July	408	1	2.87	31	12	728	78	223.82	85	2,014	0.38	558
August	333	1	2.48	31	11	727	100	248.32	63	1,719	0.25	390
Totals	968	1	2.69	92	35	1,869	237	638.64	196	4,791	0.31	1,236

Appendix Table 12. Estimated angling pressure and catch rates sorted by shift and month for rainbow trout at Spring Creek, Unit 1 (Sheridan Lake Road to Walk-in area) from June I-August 31, 1998.

	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	113	1	1.86	22	4	334	12	22.33	34	622	1.52	946
July	56	1	1.75	23	4	184	8	14.00	0	322	0.00	0
August	51	1	2.00	21	3	179	7	14.00	5	357	0.36	128

	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	105	1	2.00	8	2	210	3	6.00	2	420	0.33	140
July	107	1	2.25	8	2	190	8	18.00	22	428	1.22	523
August	75	1	1.67	10	3	150	9	15.00	11	250	0.73	183

	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	106	1	4.16	22	4	140	20	83.15	69	583	0.83	484
July	65	1	2.32	23	3	215	13	30.16	4	498	0.13	66
August	58	1	1.50	21	3	271	12	18.00	5	406	0.28	113

	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	73	1	1.35	8	2	216	9	12.15	6	292	0.49	144
July	66	1	2.18	8	2	121	14	30.50	15	264	0.49	130
August	39	1	1.22	10	2	160	9	11.00	3	195	0.27	53

ALL SHIFTS COMBINED FOR 1998 Unit 1 (Sheridan Lake Road to walk in area)

Month	count	interval	ave trip	# Days in month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish caught
June	397	1	2.81	30	12	901	44	123.63	111	1,917	0.90	1,714
July	294	1	2.15	31	11	710	43	92.66	**41**	1,512	0.44	719
August	223	1	1.57	31	11	759	37	58.00	24	1,208	0.41	477
Totals	914	1	2.21	92	34	2,369	124	274.29	176	4,637	0.64	2,910

Appendix Table 13. Estimated angling pressure and catch rates sorted by shift and month for brown trout at Spring Creek, Unit 2 (Spring Creek Walk-in area) from June 1-August 31, 1998.

Month	Weekday AM count	Weekday AM interval	Weekday AM ave trip	Weekday AM days/month	Weekday AM # censused	Weekday AM # anglers	Weekday AM # interviewed	Weekday AM intv. hours	Weekday AM fish caught	Weekday AM total hours	Weekday AM fish/hr.	Weekday AM total catch
June	83	1	2.00	22	4	228	17	34.00	20	457	0.59	269
July	79	1	2.24	23	4	203	17	38.00	15	454	0.39	179
August	56	1	2.20	21	3	178	5	11.00	5	392	0.45	178

Month	Weekend AM count	Weekend AM interval	Weekend AM ave trip	Weekend AM days/month	Weekend AM # censused	Weekend AM # anglers	Weekend AM # interviewed	Weekend AM intv. hours	Weekend AM fish caught	Weekend AM total hours	Weekend AM fish/hr.	Weekend AM total catch
June	77	1	2.38	8	2	130	20	47.50	47	308	0.99	305
July	58	1	2.77	8	2	84	21	58.25	30	232	0.52	119
August	57	1	1.90	10	3	100	5	9.50	9	190	0.95	180

Month	Weekday PM count	Weekday PM interval	Weekday PM ave trip	Weekday PM days/month	Weekday PM # censused	Weekday PM # anglers	Weekday PM # interviewed	Weekday PM intv. hours	Weekday PM fish caught	Weekday PM total hours	Weekday PM fish/hr.	Weekday PM total catch
June	64	1	4.59	22	4	77	27	123.92	96	352	0.77	273
July	87	1	2.52	23	3	265	28	70.50	34	667	0.48	322
August	71	1	2.05	21	3	242	30	61.59	9	497	0.15	73

Month	Weekend PM count	Weekend PM interval	Weekend PM ave trip	Weekend PM days/month	Weekend PM # censused	Weekend PM # anglers	Weekend PM # interviewed	Weekend PM intv. hours	Weekend PM fish caught	Weekend PM total hours	Weekend PM fish/hr.	Weekend PM total catch
June	37	1	2.45	8	2	60	21	51.50	23	148	0.45	66
July	67	1	2.05	8	2	131	20	41.00	20	268	0.49	131
August	53	1	2.70	10	2	98	16	43.25	10	265	0.23	61

ALL SHIFTS COMBINED FOR 1998 Unit 2 (Spring Creek Walk in area)

Month	count	interval	ave trip.	# Days in month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish ca -ht
June	261	1	3.02	30	12	495	85	257	186	1,265	0.72	912
July	291	1	2.42	31	11	682	86	208	99	1,621	0.48	751
August	237	1	2.24	31	11	618	56	125	33	1,344	0.26	492
Totals	789	1	2.60	92	34	1,796	227	590.01	318	4,230	0.54	2,155

Appendix Table 14. Estimated angling pressure and catch rates sorted by shift and month for rainbow trout at Spring Creek, Unit 2 (Spring Creek Walk-in area) from June 1-August 31, 1998.

	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM	Weekday AM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	83	1	2.00	22	4	228	17	34.00	4	457	0.12	54
July	79	1	2.24	23	4	203	17	38.00	3	454	0.08	36
August	56	1	2.20	21	3	178	5	11.00	1	392	0.09	36
	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM	Weekend AM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	77	1	2.38	8	2	130	20	47.50	9	308	0.19	58
July	58	1	2.77	8	2	84	21	58.25	4	232	0.07	16
August	57	1	1.90	10	3	100	5	9.50	0	190	0.00	0
	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM	Weekday PM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	64	1	4.59	22	4	77	27	123.92	15	352	0.12	43
July	87	1	2.52	23	3	265	28	70.50	4	667	0.06	38
August	71	1	2.05	21	3	242	30	61.59	8	497	0.13	65
	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM	Weekend PM
Month	count	interval	ave trip	days/month	# censused	# anglers	# interviewed	intv. hours	fish caught	total hours	fish/hr.	total catch
June	37	1	2.45	8	2	60	21	51.50	5	148	0.10	14
July	67	1	2.05	8	2	131	20	41.00	5	268	0.12	33
August	53	1	2.70	10	2	98	16	43.25	3	265	0.07	18

ALL SHIFTS COMBINED FOR 1998 Unit 2 (Spring Creek walk in area)

Month	count	interval	ave trip	# Days in month	# Days censused	Est. # of anglers	Total anglers interviewed	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish cauqht
June	261	1	3.02	30	12	495	85	257	33	1,265	0.13	169
July	291	1	2.42	31	11	682	86	208	16	1,621	0.08	122
August	237	1	2.24	31	11	618	56	125	12	1,344	0.10	119
Totals	789	1	2.60	92	34	1,796	227	590.01	61	4,230	0.10	410

Appendix Table 15. Percent of rainbow trout return to creel from Spring Creek, Unit 2 (Spring Creek Walk-in area) from June I-August 31, 1997.

Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
31-Mar-97	RF	Right Front	175	3	6%	74	21	11.9%
19-May-97	LF	Left Front	250	13	26%	321	90	36.0%
23-Jun-97	RR	Right Rear	250	5	10%	124	35	13.8%
14-Jul-97	LR	Left Rear	250	0	0%	0	0	0.0%
12-Aug-97	UC	Upper Caudal	250	2	4%	49	14	5.5%
	NC	No Clip		25	50%	618	173	NA
	W	Wild		2	4%	49	14	NA
		Totals	1,175	50	100%	1236		13.6%

* Overall percent return based on known clips.

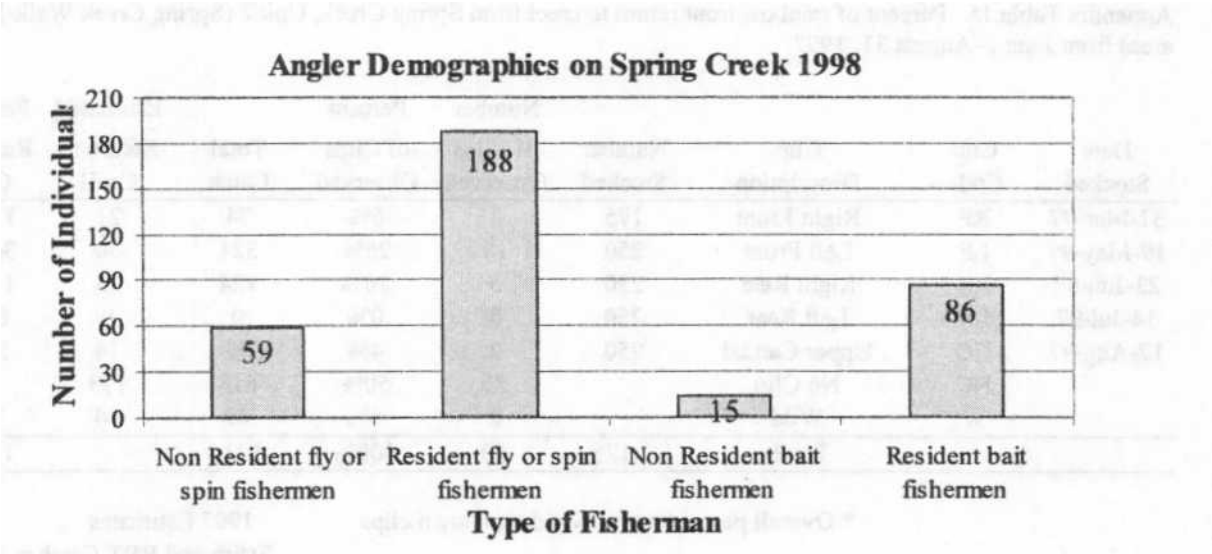
1997 Estimates
Estimated RBT Catch = 1,236
Harvest = 28%
Released = 72%

Appendix Table 16. Percent of rainbow trout return to creel from Spring Creek, Unit 2 (Spring Creek Walk-in area) from June 1--August 31, 1998.

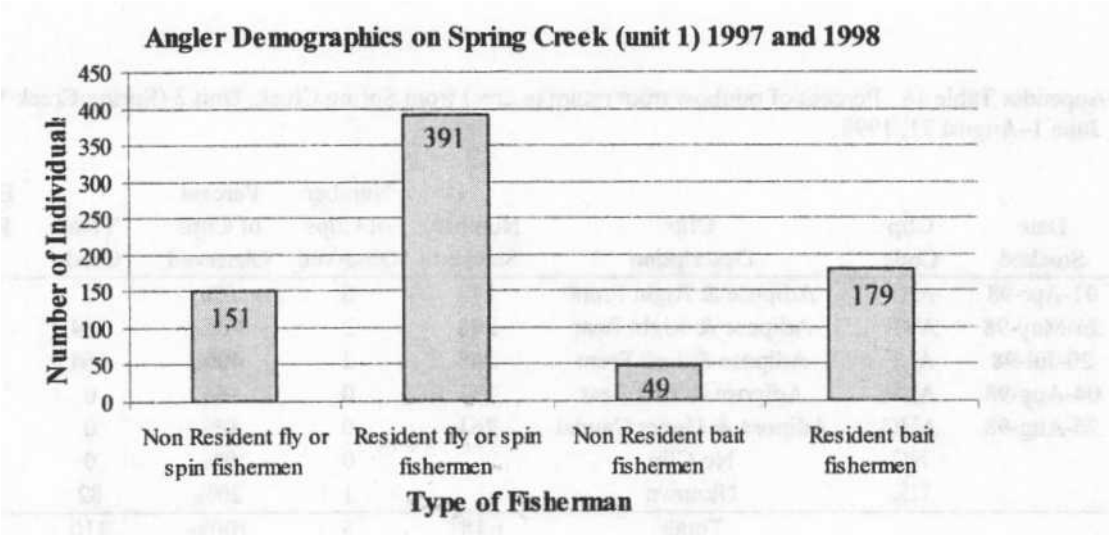
Date Stocked	Clip Code	Clip Description	Number Stocked	Number of Clips Observed	Percent of Clips Observed	Total Catch	Estimated Return to Creel	Percent* Return to Creel
01-Apr-98	ARF	Adipose & Right Front	173	0	0%	0	0	0.0%
26-May-98	ARR	Adipose & Right Rear	248	2	40%	164	43	17.2%
20-Jul-98	ALF	Adipose & Left Front	248	2	40%	164	43	17.2%
04-Aug-98	ALR	Adipose & Left Rear	251	0	0%	0	0	0.0%
26-Aug-98	AUC	Adipose & Upper Caudal	261	0	0%	0	0	0.0%
	NC	No Clip		0	0%	0	0	NA
	UK	Uknown		1	20%	82	21	NA
		Totals	1,181	5	100%	410		7.3%

* Overall percent return based on known clips.

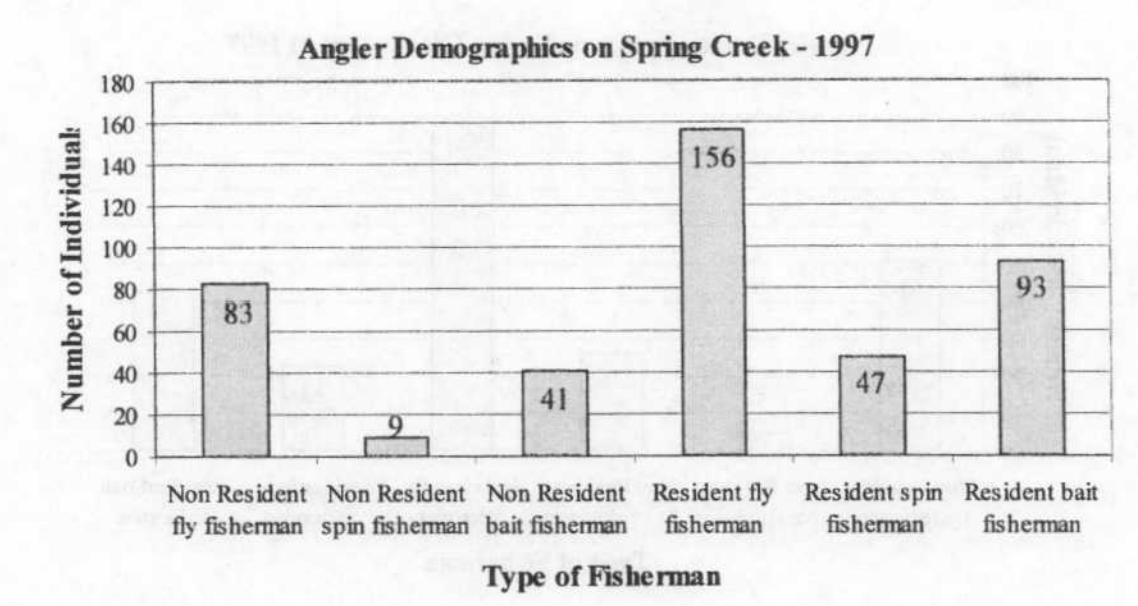
1998 Estimates
Estimated RBT Catch = 410
Harvest =26%
Released = 74%



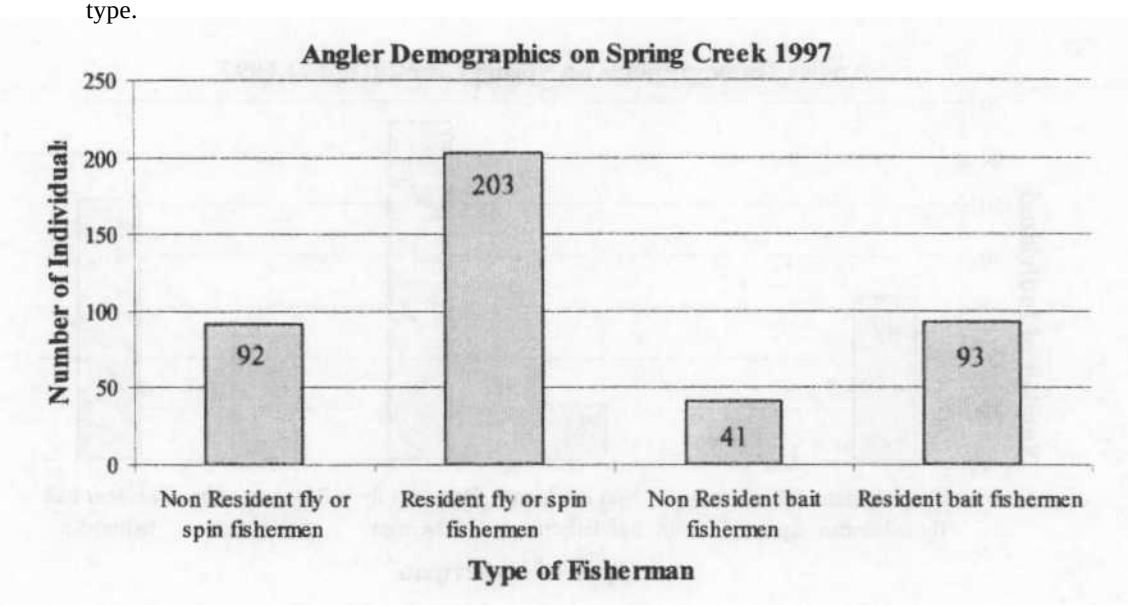
Appendix Figure 2. Number of anglers that fished Spring Creek in 1998 sorted by residency and gear type.



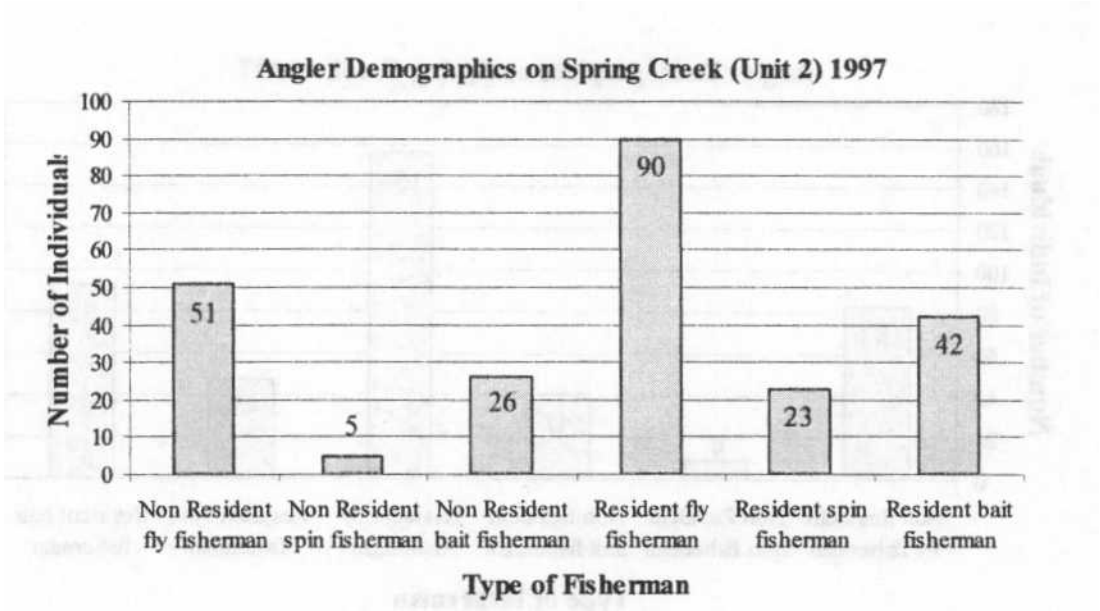
Appendix Figure 3. Number of anglers that fished Spring Creek, Unit 1 from 1997-1998 sorted by residency and gear type.



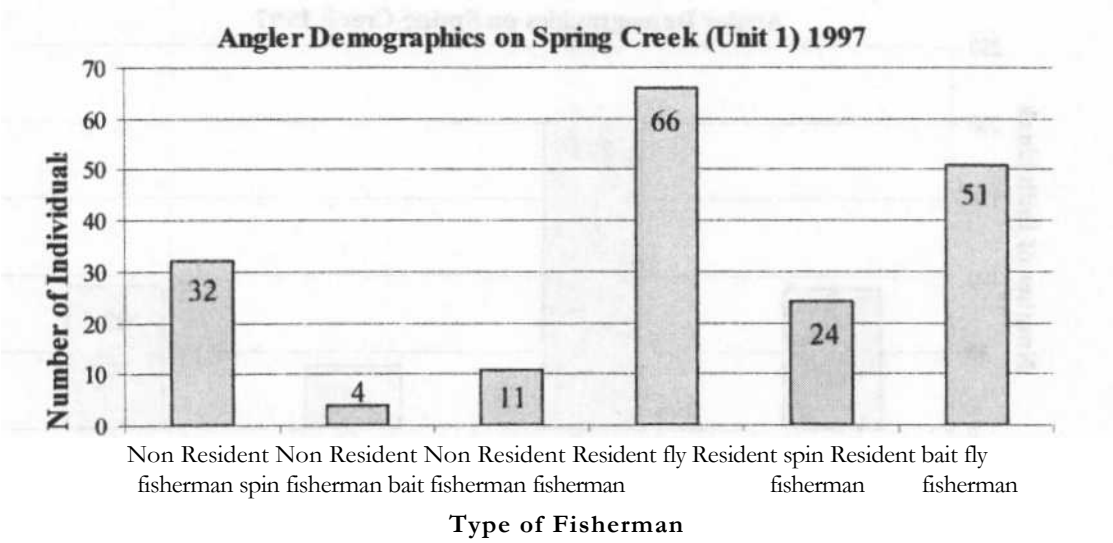
Appendix Figure 2. Number of anglers that fished Spring Creek in 1997 sorted by residency and gear type.



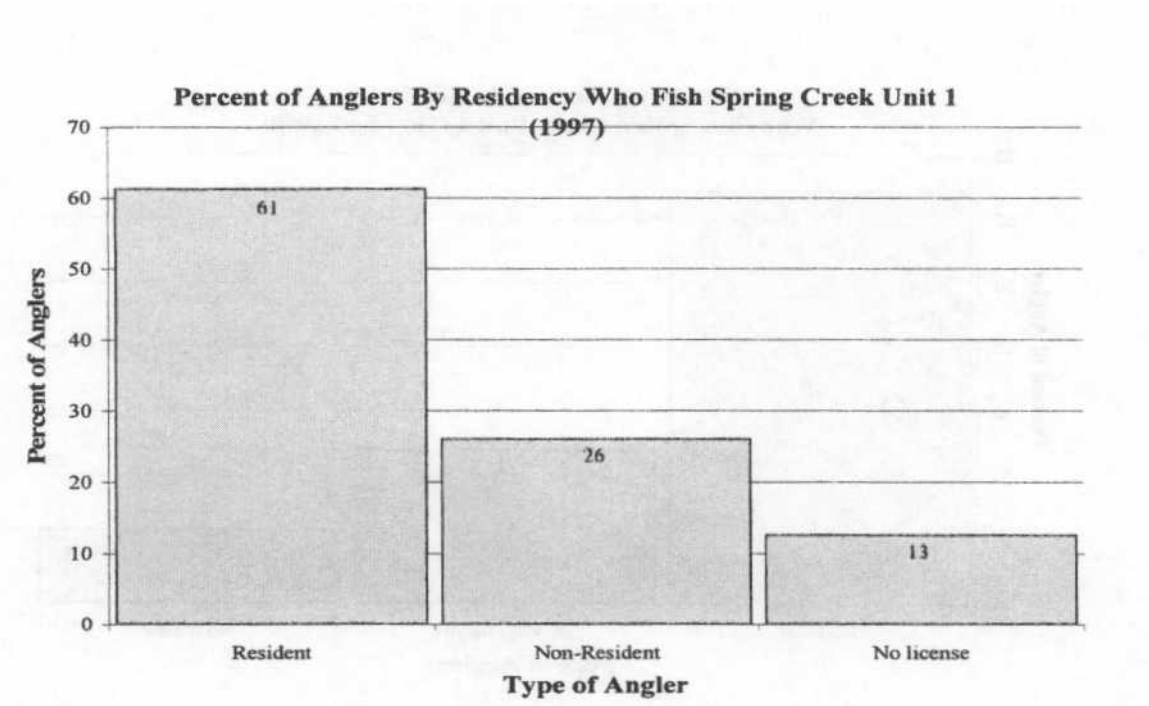
Appendix Figure 5. Number of anglers that fished Spring Creek in 1997 sorted by residency and gear type.



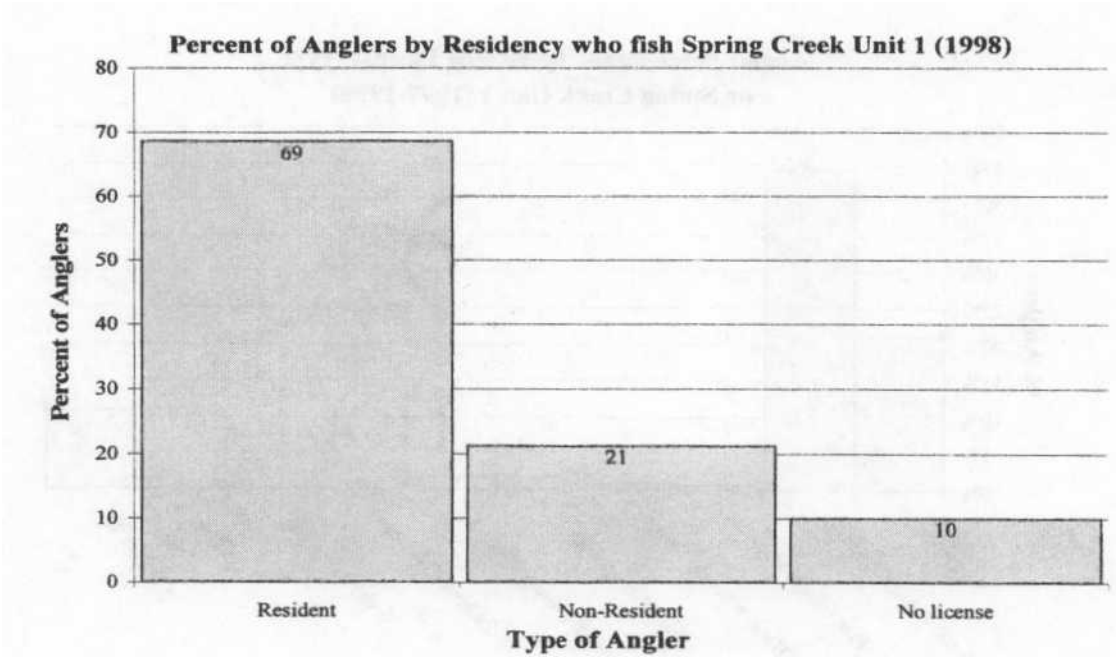
Appendix Figure 6. Number of anglers that fished Spring Creek, Unit 2 in 1997 sorted by residency and gear type.



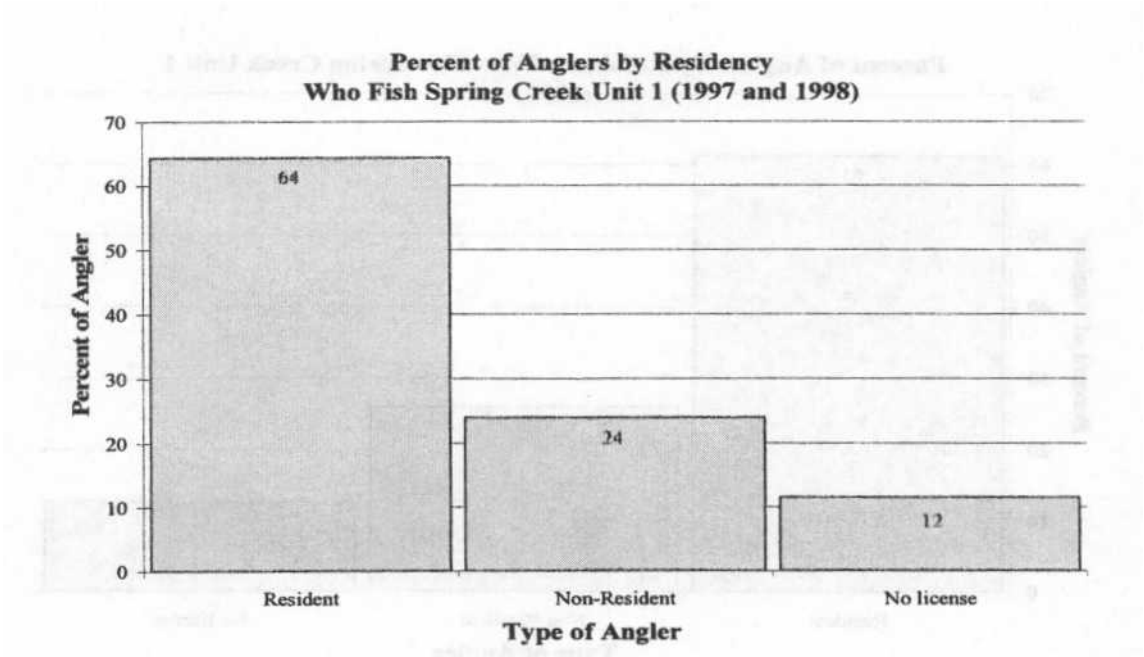
Appendix Figure 7. Number of anglers that fished Spring Creek, Unit 1 in 1997 sorted by residency and gear type.



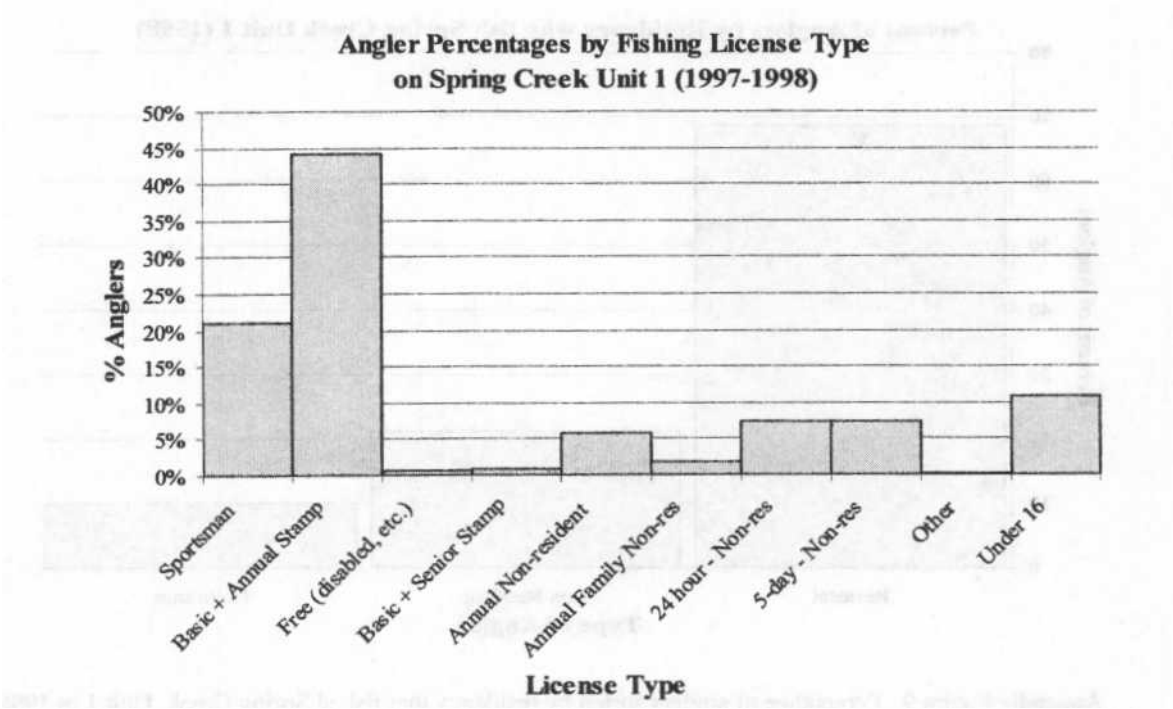
Appendix Figure 8. Percentage of anglers sorted by residency that fished Spring Creek, Unit 1 in 1997.



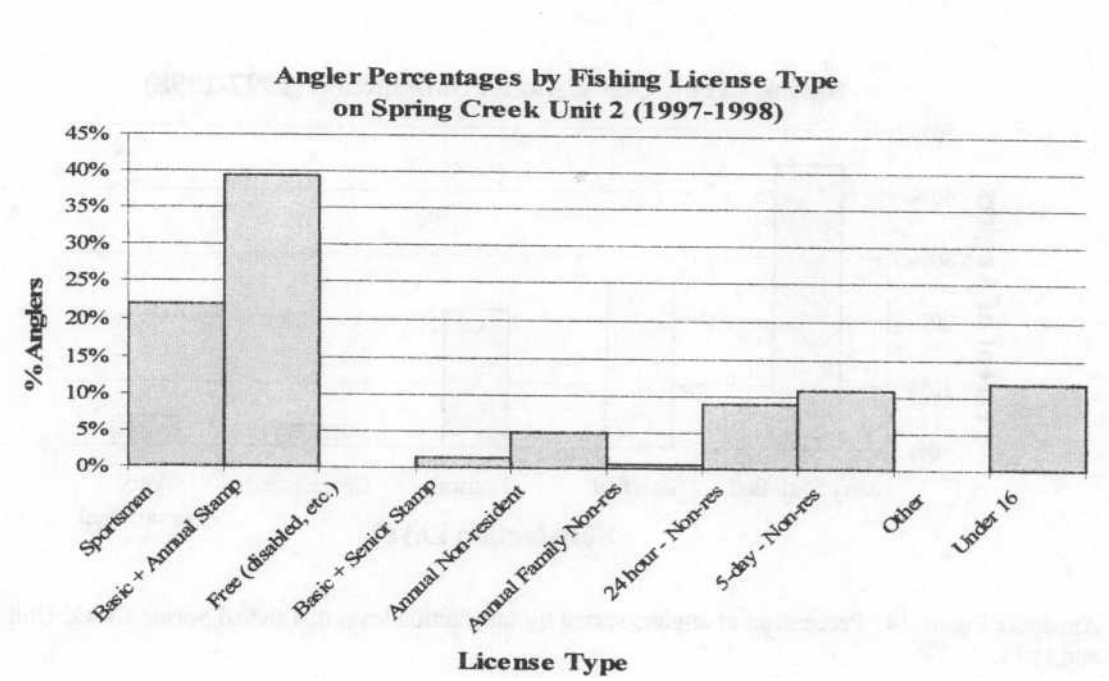
Appendix Figure 9. Percentage of anglers sorted by residency that fished Spring Creek, Unit I in 1998.



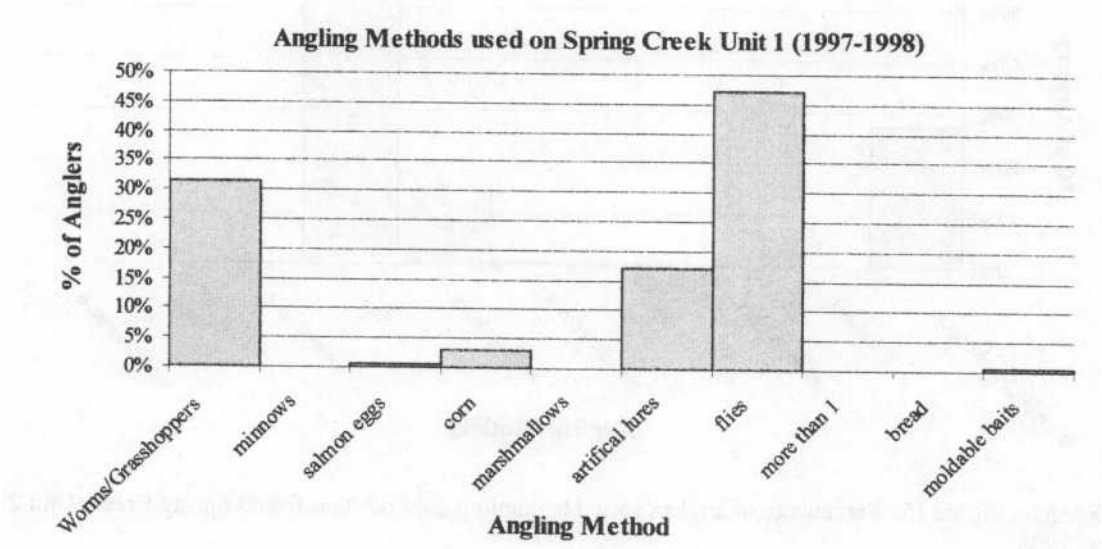
Appendix Figure 10. Percentage of anglers sorted by residency that fished Spring Creek, Unit I in 1997 and 1998.



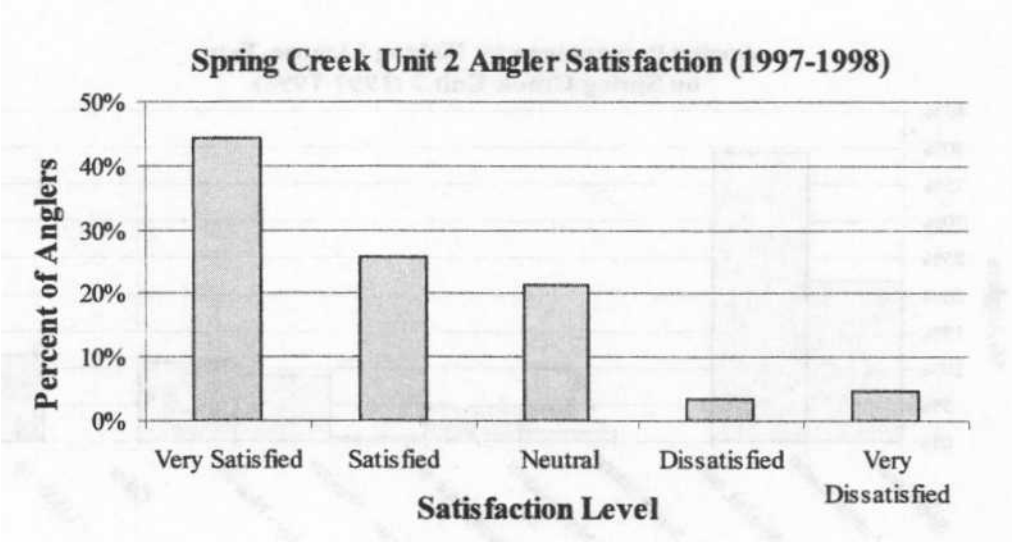
Appendix Figure 11. Percentage of anglers sorted by fishing license type that fished Spring Creek, Unit I in 1997 and 1998.



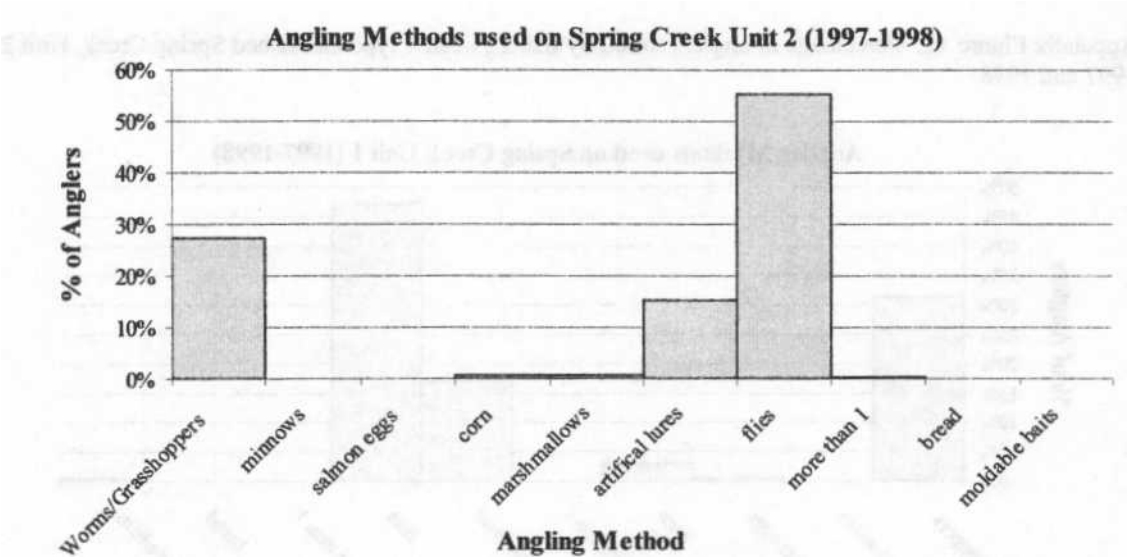
Appendix Figure 12. Percentage of anglers sorted by fishing license type that fished Spring Creek, Unit 2 in 1997 and 1998.



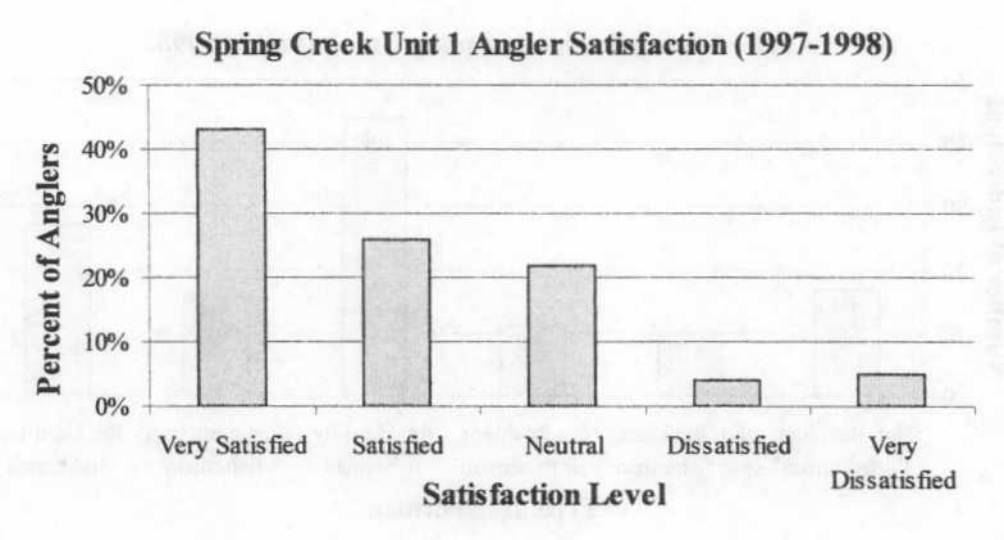
Appendix Figure 13. Percentage of anglers sorted by angling methods that fished Spring Creek, Unit I in 1997 and 1998.



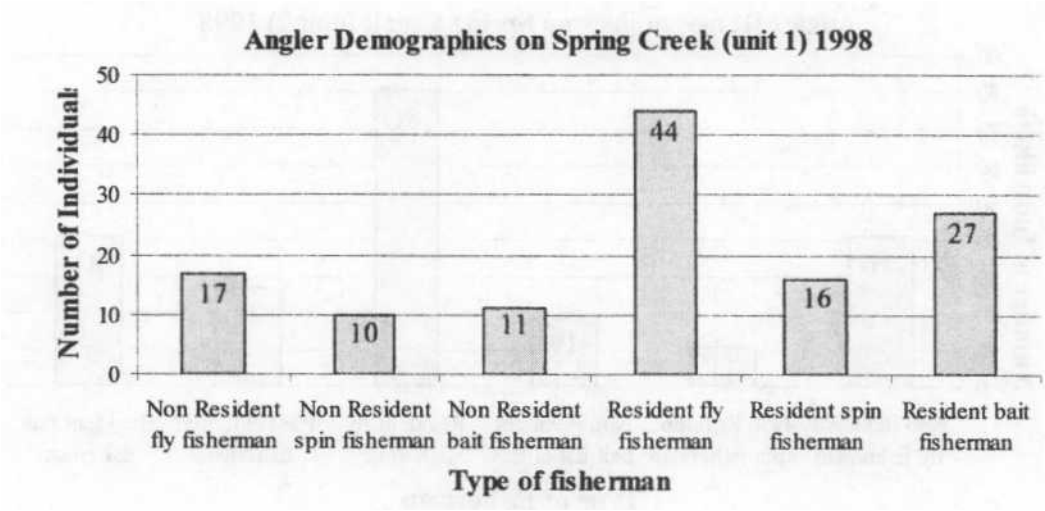
Appendix Figure 14. Percentage of anglers sorted by satisfaction level that fished Spring Creek, Unit 2 in 1997 and 1998.



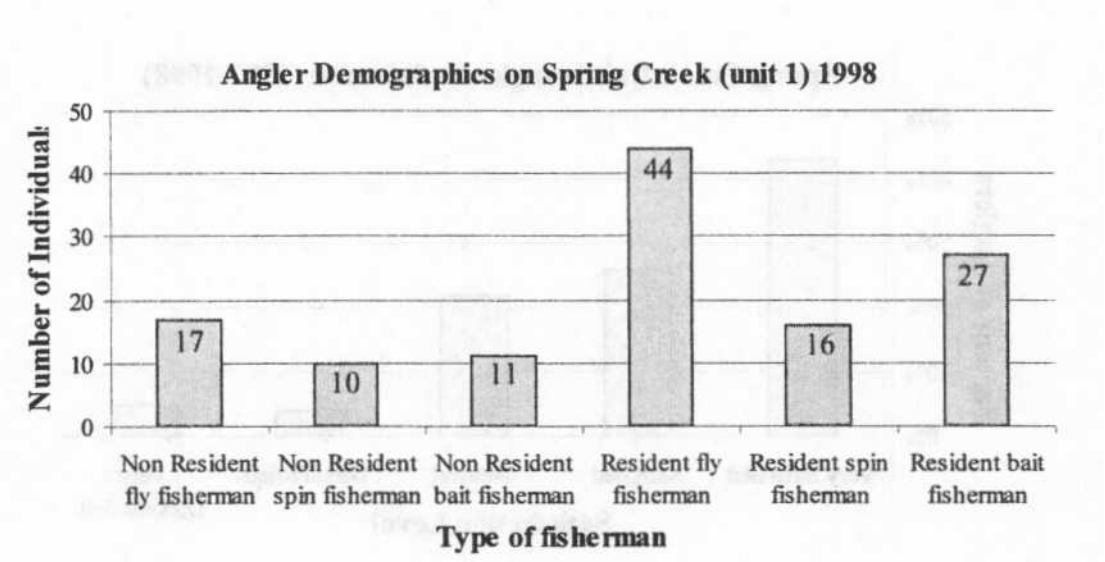
Appendix Figure 15. Percentage of anglers sorted by angling methods that fished Spring Creek, Unit 2 in 1997 and 1998.



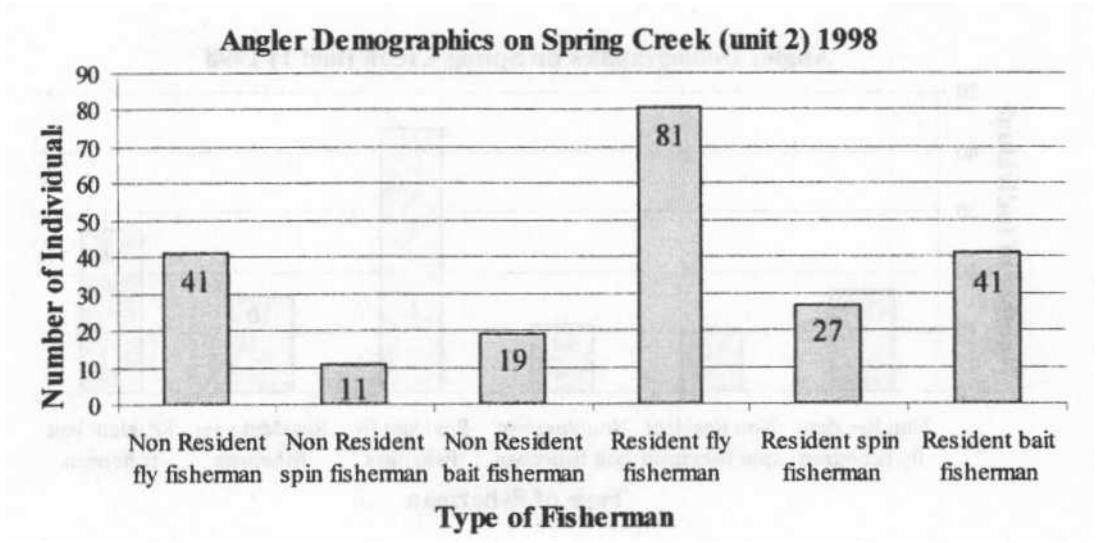
Appendix Figure 16. Percentage of anglers sorted by satisfaction level that fished Spring Creek, Unit 1 in 1997 and 1998.



Appendix Figure 17. Number of anglers sorted by residency and gear types at Spring Creek, Unit 1 in 1997 and 1998.



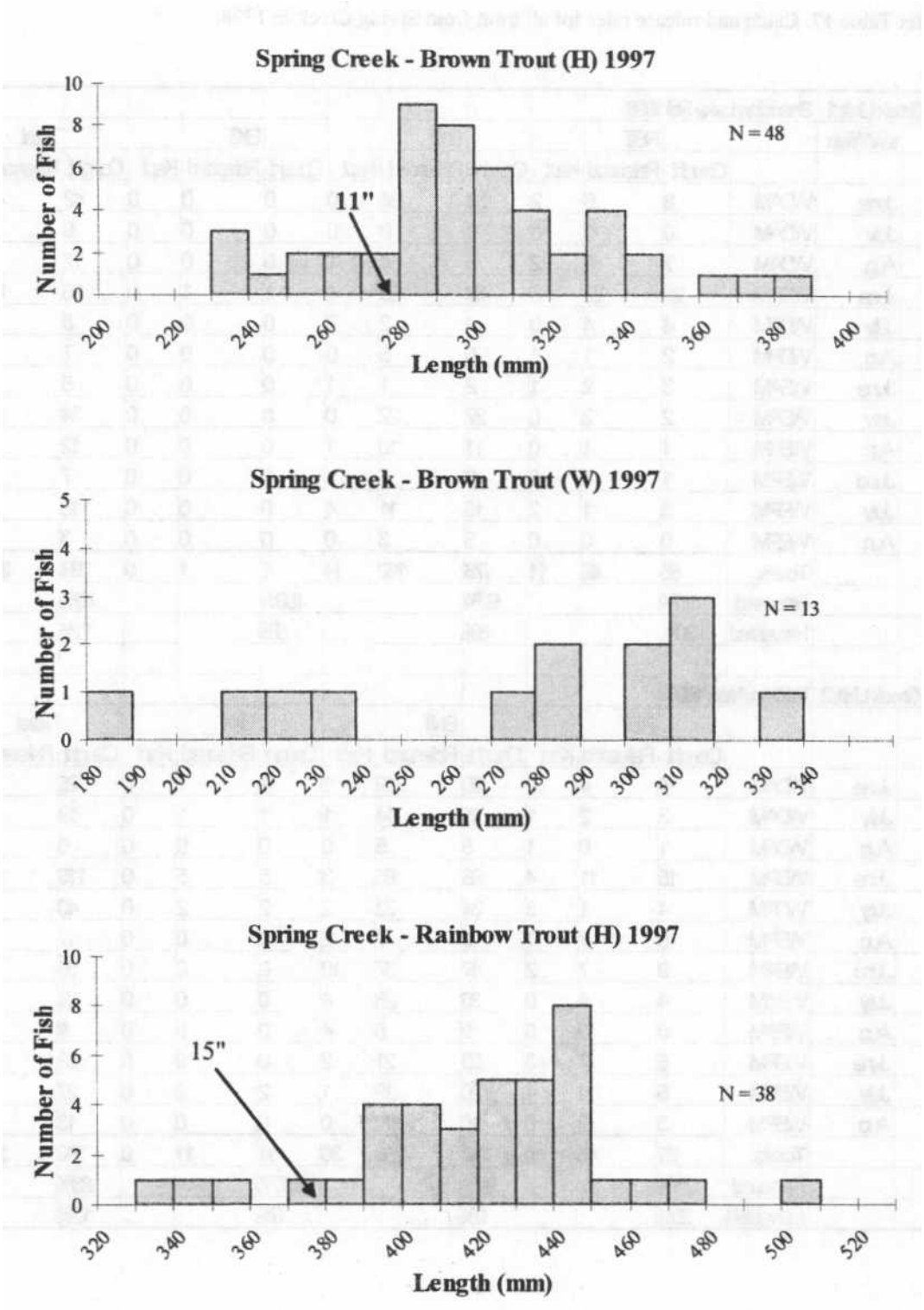
Appendix Figure 18. Number of anglers sorted by residency and gear type at Spring Creek, Unit 1 in 1998.



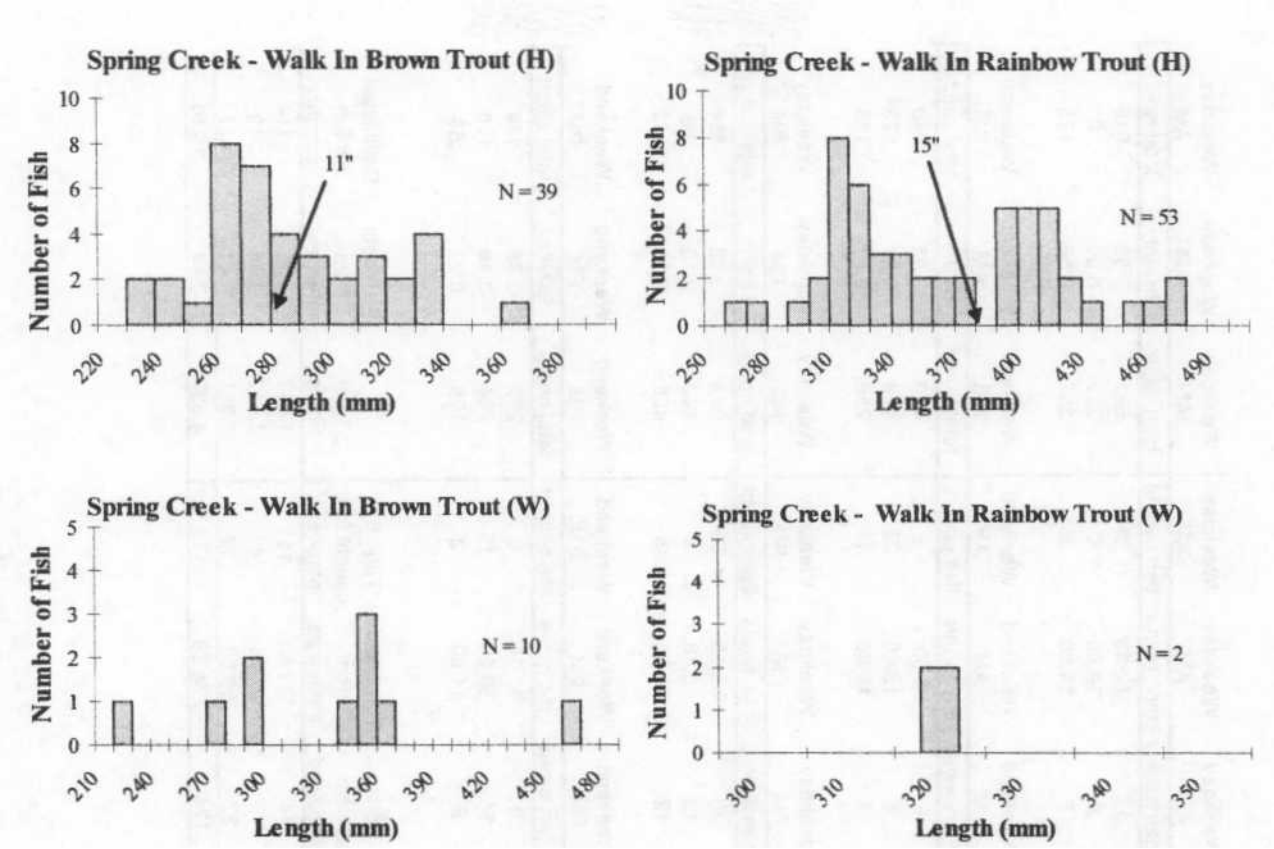
Appendix Figure 19. Number of anglers sorted by residency and gear type at Spring Creek, Unit 2 in 1998.

Appendix Table 17. Catch and release rates for all trout from Spring Creek in 1998.

Spring Creek Unit 1	Sheridan Lake Rd 1998														
	to Walkin			RBT			BNT			BKT			Total		
			Caught	Released	Kept	Caught	Released	Kept	Caught	Released	Kept	Caught	Released	Kept
	June	WDAM	8	6	2	34	34	0	0	0	0	42	40	2
	July	WDAM	0	0	0	0	0	0	0	0	0	0	0	0
	Aug	WDAM	7	5	2	5	4	1	0	0	0	12	9	3
	June	WDPM	25	22	3	69	65	4	1	1	0	95	88	7
	July	WDPM	4	4	0	4	2	2	0	0	0	8	6	2
	Aug	WDPM	2	1	1	5	5	0	0	0	0	7	6	1
	June	WEAM	3	2	1	2	1	1	0	0	0	5	3	2
	July	WEAM	2	2	0	22	22	0	0	0	0	24	24	0
	Aug	WEAM	1	1	0	11	10	1	0	0	0	12	11	1
	June	WEPM	1	1	0	6	5	1	0	0	0	7	6	1
	July	WEPM	3	1	2	15	11	4	0	0	0	18	12	6
	Aug	WEPM	0	0	0	3	3	0	0	0	0	3	3	0
		Totals	**56**	**45**	**11**	**176**	**162**	**14**	**1**	**1**	**0**	**233**	**208**	**25**
		Released	80%			92%			100%			89%		
		Harvested	20%			8%			0%			11%		
Spring Creek Unit 2	Walkin Area 1998														
				RBT			BNT			BKT			Total		
			Caught	Released	Kept	Caught	Released	Kept	Caught	Released	Kept	Caught	Released	Kept
	June	WDAM	4	4	0	20	19	1	1	1	0	25	24	1
	July	WDAM	3	2	1	15	14	1	1	1	0	19	17	2
	Aug	WDAM	1	0	1	5	5	0	0	0	0	6	5	1
	June	WDPM	15	11	4	96	93	3	5	5	0	116	109	7
	July	WDPM	4	1	3	34	32	2	2	2	0	40	35	5
	Aug	WDPM	8	7	1	9	7	2	0	0	0	17	14	3
	June	WEAM	9	7	2	47	37	10	0	0	0	56	44	12
	July	WEAM	4	4	0	30	26	4	0	0	0	34	30	4
	Aug	WEAM	0	0	0	9	5	4	0	0	0	9	5	4
	June	WEPM	5	2	3	23	21	2	0	0	0	28	23	5
	July	WEPM	5	4	1	20	19	1	2	2	0	27	25	2
	Aug	WEPM	3	3	0	10	10	0	0	0	0	13	13	0
		Totals	**61**	**45**	**16**	**318**	**288**	**30**	**11**	**11**	**0**	**390**	**344**	**46**
		Released	74%			91%			100%			88%		
		Harvested	26%			9%			0%			12%		



Appendix Figure 20. Length frequency histograms for brown and rainbow trout collected from Spring Creek in 1997.



Appendix Figure 21. Length frequency histograms for brown and rainbow trout measured in the 1997-1998 Spring Creek creel survey.

Appendix Table 18. Estimated angling pressure and catch rates sorted by shift and month for brown trout at Spring Creek, Unit I (Sheridan Lake Road to Walkin area) from June 1-August 31, 1998.

Month	Weekday AM count	Weekday AM Interval	**Weekday** AM ave trip	Weekday AM days/month	**Weekday** AM # censused	Weekday AM **# anglers**	Weekday AM # interviewed	Weekday AM intv. hours	Weekday AM fish caught	Weekday AM total hours	Weekday AM fish/hr.	Weekday AM total catch
June	113	1	**1.86**	22	4	334	**12**	22.33	34	622	1.52	**946**
July	56	1	1.75	**23**	4	184	**8**	14.00	0	322	0.00	0
August	51	1	2.00	21	3	179	7	14.00	5	357	0.36	128

Month	Weekend AM count	Weekend AM interval	Weekend AM ave trip	Weekend AM days/month	Weekend AM # censused	Weekend AM # anqlers	**Weekend** AM # interviewed	**Weekend** AM intv. hours	Weekend AM fish caught	Weekend AM total hours	Weekend AM fish/hr.	Weekend AM total catch
June	105	1	2.00	8	2	210	3	6.00	2	420	0.33	140
July	107	1	**2.25**	8	2	190	8	18.00	22	428	1.22	523
August	75	1	1.67	10	3	150	9	15.00	11	250	0.73	183

Month	Weekday PM count	Weekday PM interval	Weekday PM ave trip	Weekday PM days/month	Weekday PM # censused	Weekday PM **# anglers**	Weekday PM # interviewed	**Weekday PM** intv. hours	Weekday PM fish caught	Weekday PM total hours	Weekday PM fish/hr.	Weekday PM total catch
June	106	1	**4.16**	**22**	4	140	20	83.15	**69**	583	**0.83**	**484**
July	65	1	2.32	23	3	215	13	30.16	**4**	**498**	**0.13**	**66**
August	58	1	1.50	21	3	271	12	18.00	**5**	406	0.28	113

Month	**Weekend** PM count	**Weekend** PM interval	**Weekend** PM ave trip	**Weekend** PM days/month	**Weekend** PM # censused	Weekend PM **# anglers**	**Weekend** PM # interviewed	Weekend PM intv. hours	**Weekend PM** fish caught	Weekend PM total hours	Weekend PM fish/hr.	Weekend PM total catch
June	73	1	**1.35**	8	2	216	9	12.15	6	292	0.49	144
July	**66**	1	**2.18**	8	2	121	**14**	30.50	15	**264**	0.49	130
August	39	1	1.22	10	2	160	**9**	11.00	3	195	0.27	53

ALL **SHIFTS COMBINED FOR 1998 Unit** 1 (Sheridan **Lake Road** to walk in area)

Month	count	interval	ave trip	# Days in **month**	**# Days censused**	**Est.** # of anglers	**Total anglers interviewed**	Total hours from interviews	Total fish caught from interviews	Total hours	Fish/hour from interview	Calculated # fish caught
June	397	1	**2.81**	30	12	901	**44**	123.63	111	1,917	0.90	1,714
July	294	1	2.15	31	11	710	43	**92.66**	**41**	1,512	0.44	719
August	223	1	1.57	31	11	759	37	58.00	**24**	1.208	0.41	477
Totals	914	1	**2.21**	**92**	34	2,369	124	274.29	176	4,637	0.64	2,910

APPENDIX B

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

Name: Spring Creek County: Pennington

Seven sites in Spring Creek were surveyed in 1998. Sites I and 10 are along Sheridan Lake Road downstream of the Walk-in area below Sheridan Lake Dam and have been previously surveyed. Sites 11 and 12 were established in 1997 and along with Site 2 are located between the beginning of the Walk-in area and Sheridan Lake Dam. These five sites are within the creel survey area of 1997-1998. Site 8 is located below the Stratobowl area downstream from Sheridan Lake road and was previously surveyed in 1994. Site 14 was established in 1998 and is located near Storm Mountain Camp. Increased flows in 1998 increased stream widths, so to better cover the entire stream while electrofishing, 3 backpack electrofishing units were used rather than the normal 2.

Site A. USFS Campground - Sheridan Lake Road (1984 site 24)

Spring Creek (Site A) was surveyed on 1 September 1998. Brown trout, creek chubs, hatchery brown trout, largemouth bass, longnose dace, and white suckers were observed (Appendix Table 19). Historically, this site had been dewatered in dry years due to low flows into Sheridan Lake and/or the lowering of Sheridan Lake. Stream flows had been above normal and the practice of drawing Sheridan Lake down for weed control had been discontinued. Brown trout responded well to the increased flows caused by higher than normal rainfall and the more constant discharge from Sheridan Lake. An excellent density of brown trout <200 mm of 333 was present during the 1998 stream survey. This was the highest estimated density for that size range during any stream survey since 1993. Brown trout >200 mm total length had a density of 49 and was well above the average estimated density recorded during four stream surveys conducted from 1984 through 1997 (Appendix Table 19).

Creek chubs, abundant in 1993 and 1996, declined in numbers to one. This was likely a result of adult brown predation. Rock bass estimated numbers have remained low during recent past surveys and were not present at Site 1 in 1998. No hatchery rainbow trout was collected this year, whereas 1 was found in 1997. Hatchery brown trout were present due to current stocking. An estimated density per 100 m of 4 largemouth bass was present in 1998. No largemouth bass have been collected since the 1984 stream survey. Longnose dace and white sucker numbers remain present in low numbers.

Appendix Table 19. Species composition and number per 100 m for Spring Creek (Site 1) in 1984, 1993, 1996, 1997, and 1998.

Species/Size	Date	#per 100 m	(95% C.I.)
Brown trout <200 mm	Jul 93	23	11- 82
	Sep 96	200	185 - 215
	Sep 97	77	65- 93
	Sep 98	333	315 - 351

Brown trout 2_200 mm	Jul 84	1	na
	Jul 93	17	16- 21
	Sep 96	24	24- 25
	Sep 97	67	63- 74
	Sep 98	49	46- 55
Creek chub	Jul 84	55	na
	Jul 93	385	342 - 428
	Sep 96	96	94- 100
	Sep 97	6	5 - 13
	Sep 98	1	na
Hatchery brown trout <200mm	Sep 98	1	na
Hatchery brown trout >200mm	Jul 84	4	na
	Jul 93	19	19- 21
	Sep 96	10	10- 11
	Sep 97	14	14- 14
	Sep 98	16	na
Hatchery rainbow >200mm	Sep 97	1	1 - 2
Largemouth bass	Jul 84	1	na
	Sep 98	4	4 - 4
Longnose dace	Jul 84	1	na
	Jul 93	3	3 - 9
	Sep 96	18	16- 25
	Sep 97	4	4 - 4
	Sep 98	5	5 - 7
Rainbow trout >200mm	Jul 84	3	na
Rock bass	Jul 84	27	na
	Jul 93	4	na
	Sep 96	2	2 - 4
	Sep 97	1	na
White sucker	Jul 93	7	7 - 8
	Sep 96	6	6 - 8
	Sep 97	6	6 - 7
	Sep 98	6	6 - 8

Spring Creek (Site A) is a BNT1 wild trout stream based on the 1984-1986 classification system.

Site 2. Walk-in area below Sheridan Lake

A stream survey was conducted at Spring Creek (Site A) on 8 September 1998. This site was surveyed in 1993 and 1996, but not in 1997 as water levels were extremely low. Eight species including hatchery brown trout and hatchery rainbow trout were sampled at Site A. All but hatchery brown trout were present during the 1993 or 1996 surveys. No particular species was abundant, probably due to it being nearly dewatered during 1997 when water was released from

the discharge tube rather than the surface spillway. It also accounted for the number of species present as many no doubt came from Sheridan Lake outflows.

Appendix Table 20. Species composition and number per 100 m for Spring Creek (Site 2) in 1993, 1996, and 1998.

Species/Size	Date	# per 100 m	95% C.I.
Brown trout <200 mm	Sep 93	2	2 - 7
	Sep 96	8	8 - 8
	Sep 98	1	1 - 2
Brown trout 2_200 mm	Sep 93	9	9 - 9
	Sep 96	16	14- 23
	Sep 98	11	11- 13
Creek chub	Sep 93	373	371 -475
	Sep 96	9	9 - 11
Green sunfish	Sep 93	1	1 - 5
Hatchery brown trout 2_200 mm	Sep 98	31	30- 35
Hatchery rainbow trout <200 mm	Sep 93	1	1 - 2
	Sep 96	1	na
Hatchery rainbow trout 2_200 mm	Sep 93	9	9 - 10
	Sep 96	104	100-110
	Sep 98	1	1 - 2
Largemouth bass	Sep 96	1	1 - 4
	Sep 98	23	11- 82
Northern pike	Sep 93	1	1 - 4
	Sep 98	2	2 - 3
Rock bass	Sep 93	23	11- 82
	Sep 96	20	10- 70
	Sep 98	36	33 - 43
White sucker	Sep 93	8	8 - 10
	Sep 96	27	12- 102
	Sep 98	20	10- 70
Yellow perch	Sep 93	6	6 - 7
	Sep 96	2	2 - 3
	Sep 98	2	2 - 4

Spring Creek (Site A) is a BNT2 wild trout stream based on the 1984-1986 classification system.

Site 8. Stratobowl area

A stream survey was conducted at Spring Creek (Site 8) on 28 September 1998 and previously on 19 September 1994. This site has limited access because it requires access through private

property or a long hike. Rumors of large brown trout taken from this stretch were heard prior to the low-water years in the late 1980's and early 1990's. Mean water flows for the water year 1989 as reported by the USGS in their Water-Data Report SD-89-A were 0.98 cfs with minimum flows at times of 0.00.

Seven species including brown trout, creek chubs, green sunfish, longnose dace, northern pike, rock bass, and white suckers were sampled. No brown trout, green sunfish, or northern pike were observed during the 1994 survey (Appendix Table 21). Brown trout or hatchery brown trout have apparently moved downstream and established a naturally reproducing population at Site 8. Multiple age classes of brown trout were collected. Creek chubs, longnose dace, and rock bass all have fewer numbers than in 1994.

Appendix Table 21. Species composition and number per 100 m for Spring Creek (Site 8) in 1994 and 1998.

Species/Size	Date	# per 100 m	95% C.I.
Brown trout <200 mm	Sep 98	103	80- 131
Brown trout ?200 mm	Sep 98	36	35- 40
Creek chub	Sep 94	4,215	843-8,497
	Sep 98	47	44- 53
Green sunfish	Sep 98	27	12- 102
Longnose dace	Sep 94	64	28- 180
	Sep 98	16	12- 30
Northern pike	Sep 98	1	na
Rock bass	Sep 94	207	136- 279
	Sep 98	11	11- 13
White sucker	Sep 94	2	na
	Sep 98	7	7- 8

Spring Creek (Site 8) is a BNT1 wild trout stream based on the 1984-1986 classification system.

Site 10. Between 1st and And bridges on Sheridan Lake Road

Spring Creek (Site 10) was surveyed 1 September 1998. Brown trout, creek chubs, hatchery brown trout, hatchery rainbow trout, largemouth bass, longnose dace, rock bass, and white suckers were sampled. Largemouth bass were a species not sampled previous to 1997 (Appendix Table 22). Brown trout numbers (<200 mm) have nearly doubled since 1996, whereas brown trout ? 200 mm have remained stable. Creek chubs and white suckers have exhibited a marked decline at Site 10 since 1996, possibly due to predation by brown trout and rainbow trout. Largemouth bass present at Site 10 had a mean length of 169 mm and are probably not a factor as predators at this time.

Appendix Table 22. Species composition and number per 100 m for Spring Creek (Site 10) in 1996, 1997, and 1998.

Species/Size	Date	# per 100 m	(95% C.I.)
Brown trout <200 mm	Sep 96	35	28- 50
	Sep 97	65	46- 96
	Sep 98	69	73- 68
Brown trout >200 mm	Sep 96	20	20- 20
	Sep 97	25	22- 33
	Sep 98	19	18- 23
Creek chub	Sep 96	335	92- 1,006
	Sep 97	13	12- 17
	Sep 98	18	6 - 131
Hatchery brown trout >200mm	Sep 96	15	15- 15
	Sep 97	31	31 - 33
	Sep 98	9	9 - 10
Hatchery rainbow >200mm	Sep 97	2	2 - 3
	Sep 98	2	2 - 3
Largemouth bass	Sep 98	2	2 - 6
Longnose dace	Sep 96	40	8 - 463
	Sep 97	40	8 - 475
	Sep 98	29	22- 46
Rock bass	Sep 96	2	2 - 7
	Sep 97	2	2 - 2
	Sep 98	3	3 - 3
White sucker	Sep 96	70	14- 623
	Sep 97	6	4 - 21
	Sep 98	11	11- 13

Spring Creek (Site 10) is a BNT2 wild trout stream based on the 1984-1986 classification system.

Site 11. Below Sheridan Lake discharge tube

Spring Creek (Site 11) was a new site selected in 1997. This site allowed for sampling above the Sheridan Lake discharge tube and had very low water flows during the 1997 fall surveys. The 1998 stream survey at Site 11 was conducted on 8 September. Brook trout, brown trout, hatchery brown trout, hatchery rainbow trout, largemouth bass, northern pike, rock bass, white suckers, and yellow perch were sampled at Site 11 (Appendix Table 23). Brown trout <200 mm numbers were estimated at 38 in 1997 and increased to 46 in 1998. Estimated numbers of brown trout >200 mm were 60, which decreased from the 1997 levels of 119 (Appendix Table 23).

The presence of hatchery brown trout and hatchery rainbow trout are a result of Game, Fish, and Parks stockings. The occurrence of a brook trout is somewhat of a mystery. Brook trout are present in Horse Creek and Spring Creek above Sheridan Lake. While possible for brook trout to move into the lake and down Spring Creek, it would be unusual. The other species are most likely present because of downstream movement from Sheridan Lake.

Appendix Table 23. Species composition and number per 100 m for Spring Creek (Site 11) in 1994 and 1998.

Species/Size	Date	# per 100 m	95% C.I.
Brook trout >_200 mm	Sep 98	1	na
Brown trout <200 mm	Oct 97	38	34- 46
	Sep 98	46	23- 119
Brown trout ?200 mm	Oct 97	119	116- 124
	Sep 98	60	60- 61
Hatchery brown trout ?200 mm	Oct 97	20	20- 22
	Sep 98	19	19- 20
Hatchery rainbow trout ?200 mm	Oct 97	12	12- 12
	Sep 98	1	na
Largemouth bass	Oct 97	33	31- 38
	Sep 98	13	12- 18
Northern pike	Oct 97	1	1 - 2
	Sep 98	1	na
Rock bass	Oct 97	12	10- 20
	Sep 98	14	11 - 25
White sucker	Oct 97	10	10- 10
	Sep 98	19	19- 19
Yellow perch	Oct 97	1	na
	Sep 98	1	na

Spring Creek (Site 11) is a BNT1/BKT3 wild trout stream based on the 1984-1986 Black Hills stream classification system.

Site 12. Lower end of walk-in area

Spring Creek (Site 12) was surveyed on 15 September 1998. Brown trout, golden shiners, hatchery brown trout, hatchery rainbow trout, largemouth bass, longnose dace, rock bass, white suckers, and yellow perch were sampled (Appendix Table 24). Brown trout numbers for Site 12 in 1998 decreased from 1997 levels regardless of size range. Hatchery trout populations fluctuated but are probably due to stocking activities. Creek chubs were not found during the 1998 survey and rock bass populations also declined. Largemouth bass number estimates were

higher in 1998, but the mean length of 165.5 mm indicates young fish, probably from Sheridan Lake outflows. White suckers increased from 62 in 1997 to 84 in 1998.

Appendix Table 24. Species composition and number per 100 m for Spring Creek (Site 12) in 1994 and 1998.

Species/Size	Date	Pop. Est.	95% C.I.
Brown trout <200 mm	Oct 97	25	23- 31
	Sep 98	12	10- 20
Brown trout >_200 mm	Oct 97	87	86- 90
	Sep 98	39	39- 41
Creek chub	Oct 97	3	3 - 6
Golden shiner	Oct 97	2	2 - 4
	Sep 98	3	3 - 4
Hatchery brown trout <200 mm	Sep 98	1	1 - 2
Hatchery brown trout ?200 mm	Oct 97	37	37- 39
	Sep 98	45	45- 46
Hatchery rainbow trout >_200 mm	Oct 97	14	9 - 35
	Sep 98	4	4 - 11
Largemouth bass	Oct 97	7	7 - 9
	Sep 98	15	*15*- 16
Longnose dace	Oct 97	1	1 - 4
	Sep 98	1	1 - 2
Rock bass	Oct 97	24	18- 40
	Sep 98	11	10- 16
White sucker	Oct 97	62	61- 65
	Sep 98	84	79- 92
Yellow perch	Oct 97	1	1 - 5
	Sep 98	2	2 - 4

Spring Creek (Site 12) is a BNT1 wild trout stream based on the 1984-1986 Black Hills stream classification system.

Site 14. Storm Mountain Camp

Spring Creek (Site 14) is a newly established site between the Stratobowl area and Sheridan Lake road. The stream survey was conducted on 29 September 1998 to gather baseline data on fish populations. Numerous long, deep pools exist in the area surveyed. The stream is in a steep sided canyon and the pools are bedrock with rubble and little sediment or vegetation.

Brown trout, creek chubs, hatchery brown trout, rock bass, and white suckers were sampled during the survey. Similar to Site 8 near the Stratobowl, Site 14 has a reproducing population of wild brown trout. A healthy population of creek chubs exists at this site, but will probably decline as the brown trout population becomes more firmly established as has happened upstream near Sheridan Lake.

Spring Creek (Site 14) is a BNT1 wild trout stream based on the 1984-1986 Black Hills stream classification system.